CHAP. VI.

State of Agriculture in Upper California.—Its Produce in Grain, and Live Stock.

The lands of California, as we have seen, are almost exclusively in the hands of the missionaries, and consequently its agricultural operations are chiefly carried on by them. This art or science is well known not to be even now in a very advanced state in Spain, and could not possibly have been well understood—even in its then state—by the monks who first settled in California in the last century. The actual state of agriculture in this country—which has not in any degree improved since its first introduction—may, consequently, easily be imagined to be most rude and backward. It is not thought necessary by those primitive farmers to study the use of fallows or green crops; to adopt the six or seven *course shift*, or any other shift whatever; nor to study the alternation of white and leguminous grains, or any such modes of improved husbandry: these are refinements they

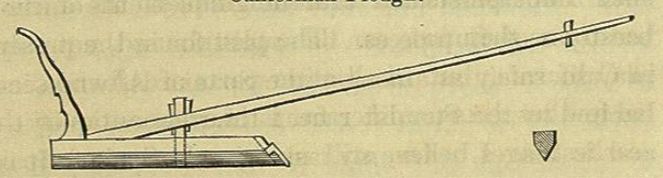
never heard or dreamed of, and it would be as reasonable to expect, that they should adopt such novelties, as that they would the doctrines of Luther or Calvin. Their only plan of renovating the fertility of an exhausted soil, is to let it rest from culture, and to abandon it to its native weeds until it may again be thought capable of bearing crops of grain. From the superabundance of land in the country, a second cultivation of exhausted ground is not resorted to for many years, and perhaps not at all.

The grains chiefly cultivated are maize or Indian corn; wheat; barley; and a kind of small bean called *frixol:* this bean is in universal use all over Spanish America, and is a most pleasant food. They are cooked, when in a ripe state, fried with lard, and much esteemed by all ranks of people.

Maize is the staple bread corn and is cultivated in rows or drills. The cultivation of this grain is better managed than that of the others, and is certainly superior to what might be expected from such rude farmers and with such implements of husbandry as they possess. The plough used, not only in California, but in all other parts of America inhabited by the Spanish race, is of great antiquity—and is also I believe still used in old Spain. It is composed of two principal pieces, the one which we shall call the main piece, is formed out of a

crooked branch of timber cut from the tree, of such a natural shape as to form this main piece, which constitutes of itself the sole and handle or stilt; it has only one handle, and no mould-board or other contrivance for turning over the furrow, and is therefore only capable of making a simple rut equal on both sides: a share is fitted to the point of the sole, but without any feather, and is the only iron in the whole construction of the plough. The other piece is the beam, which is of great length so as to reach the yoke of the oxen by which the plough is drawn; this beam is also formed of a natural piece of wood, cut from a tree of the necessary dimensions, and has no dressing except the taking off the bark: it is inserted into the upper part of the main piece, and connected with it by a small upright piece of wood on which it slides, and is fixed by two wedges: by withdrawing those wedges the beam is elevated or lowered, and by this means the plough is regulated as to depth of furrow, or what ploughmen call, giving more or less earth.

Californian Plough.



The long beam passes between the two oxen like the pole of a carriage or ox-wain, and no chain is

required for drawing the plough: a pin is put through the point of the beam which passes before the yoke, and is fixed there by thongs of raw hide. The ploughman goes at one side of the plough holding the handle or stilt with his right hand, and managing the goad with his left. There are never more then two oxen used in these ploughs, and no driver is required; the ploughman managing the plough and directing the oxen himself. The manner of yoking the oxen is not as is done in the north of Europe, by putting the yoke on the shoulders and fixing it by a wooden collar or bow, round the neck: the yoke is placed on the top of the head close behind the horns, tied firmly to their roots and to the forehead by thongs, so that instead of drawing by the shoulders they draw by the roots of the horns and forehead. When oxen are so bound up they have no freedom to move their heads; they go with their noses turned up, and seem to be under great pain.

I know not if this was the custom of the ancients; but I am persuaded that no guide to the ancient customs of Europe can be sought for in the present day so safely as amongst the Spaniards, who seem in few respects to differ from their ancestors of the earliest ages. On my asking a native of Spain what could be the motive for making an ox to draw by the head, and a horse by the shoulders; he re-

plied, that wise men had found, that particular animals had their strength lodged in particular parts of their body; and it was found that the strength of the ox lay in its horns. I then stated to him that almost all other nations thought otherwise, and yoke their oxen by the shoulders; therefore, the question was, whether the Spaniards or the other nations were in the right; to this he immediately replied in a tone of indignation, "What! can you suppose that Spain which has always been known as the mother of the sciences can be mistaken on that point?" Against this, of course, no further argument could be offered; and in the Americas oxen will continue to draw by the horns perhaps for ages to come, as taught by their scientific mother of Spain. Their carts are drawn by oxen yoked in the same manner; and in this case, they have to bear the weight of the load on the top of their heads, which is certainly the most disadvantageous mechanical point of the whole body: this renders their sufferings more severe than in the plough, and it is truly distressing to see the poor animals writhing under a load which on their backs or shoulders, they could easily support. The form of the ox-cart is as rude as that of the plough; it is composed of a bottom frame of a most clumsy construction, on which is raised a body of a few bars stuck upright, of a great height, and connected at

the top with other slight bars; this cart is usually without lining, but when used for carrying maize, it is lined with canes tied to the upright bars. The pole is of very large dimensions, and long enough to be fastened to the yoke in the same manner as the beam of the plough. This also adds greatly to the distress of the poor oxen, because, the pole being tied fast to the yoke which rests on their heads, they feel every jerk and twist of the cart in the most sensible manner; and when the road is full of stones, sloughs, and all manner of obstructions, as it generally is in America, it appears as if the animal's head would every moment be twisted off!

The wheels of the Californian ox-cart, as well as those of the other Spanish Americas, are of a most singular construction. They have no spokes, and are composed of only three pieces of timber. The middle piece is hewn out of a huge tree, of a sufficient size to form the nave and middle of the wheel all in one: this middle piece is made of a length equal to the diameter of the wheel, and rounded at the two ends to arcs of the circumference. The other two pieces are made of timber naturally bent and joined to the sides of the middle piece by keys or oblong pieces of wood, groved into the ends of the pieces which form the wheel: the whole is then made circular, and resembles the wheels of the

barrows used in the north of Scotland for carrying peat or turf out of the mosses or bogs. There does not enter into the construction of this cart a particle of iron, not even a nail, for the axle is entirely of wood, and the linch-pin of the same material, as well as the pins that fix the cart to the axle.

From the construction of the plough, as already described, it will be perceived, that there being no mould board or feathered shear, the furrow cannot be cut up and turned over as with an English plough, a rut only being made; consequently the soil can only be broken by successively crossing and recrossing the field many times; and it is evident that however often crossed by a machine of this kind, the root weeds of any tenacity can never be cut, so that this mode of ploughing must always be very imperfect; and although four or five crossings are often given, yet the soil is not sufficiently broken or the weeds eradicated.

The necessity of giving so many crossings is a great waste of labour; and as the ploughing is deferred till the commencement of the rains, and very near the time of sowing, an immense number of ploughs must be employed; it is no uncommon thing to see on the large maize estates in some parts of Mexico, upwards of one hundred ploughs at work together! With these ploughs it is not necessary to divide the field into ridges or brakes. As they are equal on both sides they have only to begin at one side of the field and follow one another up and down, as many as can be employed together without interfering in turning round at the end, which they do, in succession, like ships tacking in a line of battle, and so proceed down the same side as they came up.

A harrow is totally unknown, and where wheat or barley is sown a bush is generally used to cover in the seed; but in some places, instead of this, a long heavy log of wood is drawn over the field something on the plan of a roller, but dragging without turning round, so as to carry a portion of the soil over the seed.

In the cultivation of maize, when the field is sufficiently ploughed or crossed, a rut or furrow is made by the plough at the distance intended for the drills, which is generally five or six feet. In this rut the seed is deposited by hand, the labourers carrying it in small baskets, out of which they take a handful and drop from three to five grains at once, which they slightly cover with their foot from the loose earth on the side of the rut; and so proceed depositing a like number of seeds at the distance of about three feet. In this state the seed is left to spring up to a moderate height, and then the ploughs are again put to turn a furrow on each

side of the rut towards the young plants, thus forming a drill. When the maize grows up to a considerable height, it is commonly cleaned by hand, by pulling up the weeds; the middle between the drills, is again turned up by the plough passing up and down, and the labour is then finished.

The sowing of maize as well as of other grains in Upper California, commences in November, or as near the commencement of the rains as possible, and the harvest is in the months of July and August.

The process of harvesting maize is as follows. The labourer carries with him a large and very deep basket of wicker work, with which he proceeds along the drills and fills it with the heads of maize; when full he carries it on his back to the end of the field where an ox-cart is stationed, and into which he empties his basket; when the cart is full it proceeds to the place of deposit. In this way the stalks are all left; and when all their heads are gathered the cattle are then turned into the field and eat up the leaves and such part of the stalks as are eatable; these are found to be very nutritious; and the cattle get fat at this season more than on the best grass pastures.

The next operation is to separate the maize from the head or husk. This is done by rubbing the full head againt a few empty husks bound together,

and is a very tedious operation. Maize in warm countries is very liable to spoil, and to be infested by an insect called in Spanish *gorgoja;* and as it is found that maize keeps longer in the husk, it is sometimes left so till it is required for use; but although it may be kept somewhat longer in this state than when separated, yet it is also soon subject to the attack of this insect. On the coast of the tropical country of Mexico, it is difficult to keep maize above six or eight months, but in California it can be kept for a much longer time. Perhaps by kiln-drying and other methods, maize might be preserved even in tropical climates for a great length of time; but I have seen no attempt at any plan of this kind, although it would be, if successful, attended with immense benefit to the growers of this grain in the populous parts of Mexico; particularly on the coast, where the prices vary so much in different years, and even at different seasons of the same year.

The produce of maize, in proportion to the seed, is perhaps more than that of any other grain whatever; but this doubtless chiefly arises from its being always planted in drills, and I am not certain if wheat and other grains might not give equal returns if planted or dibbled in the same way. The return from maize in good land is often as high as a hundred and fifty fold, and even higher, and if it is much un-

der a hundred it is thought to be an inferior crop. The calculation however of the produce of grain by returns from the seed, is founded on an erroneous principle; but in South America it is always so calculated, as they have no fixed land measure, so that it is difficult to ascertain what any certain quantity of land actually produces. This has led to very mistaken notions respecting the fertility of those countries. When I first arrived in Chili I was told that wheat seldom or never yielded less than fifty returns, and that it sometimes gave one hundred and fifty, but could not reconcile this with the appearance of the crops I saw in the fields, which certainly never surpassed the appearance of a good crop in England. I could only suppose that it was to be accounted for by thin sowing, which I afterwards found to be the fact. Perhaps on measuring an acre of land in any part of the world, the produce in any kind of grain will not greatly exceed that of the best crops of wheat produced in the north of Europe. I measured a small piece of ground in Mexico sown with barley, and the seed used was about the third part of what is ordinarily used in England, but I had not an opportunity of ascertaining its produce: it must have produced three times as much from the seed as the ordinary returns in England, to have given an equal quantity per acre as in that country. One thing, however, may be

allowed which is, that grain raised by irrigation in hot countries must produce more than by any other mode of cultivation; and as much of the wheat in South America is cultivated in that way, the produce in such circumstances may be more than in Europe: but I have never seen even by irrigation any thing which could promise a very superior return per acre to a heavy crop in England.

Wheat is sown "in broad-cast" on land prepared as for maize. In the south of California, owing to the length of the dry season, it is cultivated by irrigation; but in the north, and particularly round the bay of San Francisco, as formerly stated, the rains and dews are sufficient, and irrigation is not necessary. From the lands being new, and naturally fertile, the produce of wheat ought to be very great; and from the excellence of the climate the quality of the grain should be very fine. Samples of wheat from the Cape of Good Hope were exhibited many years ago in London as a curiosity for their superior fineness, and sold at an exorbitant price for seed. California corresponds in situation to the Cape of Good Hope; and if the culture and quality of the seed were attended to, wheat of equal fineness must be produced. At present from the unskilfullness of the culture, and the inattention to procure good seed, neither the quantity nor quality is equal to what they ought to be. The