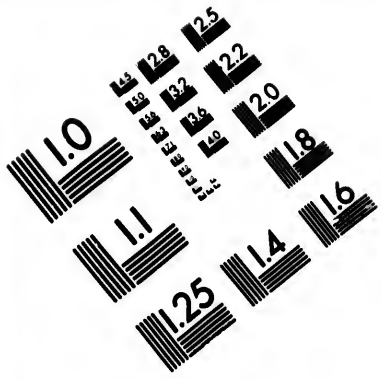

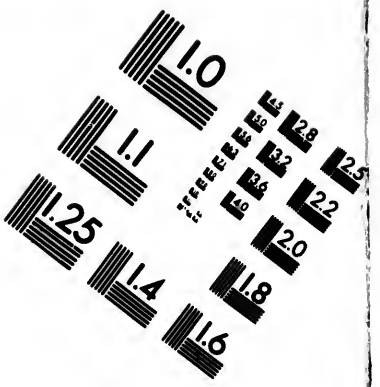

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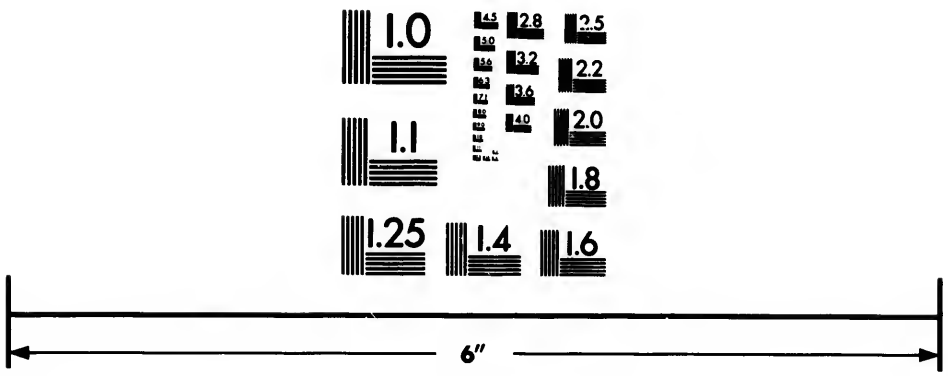

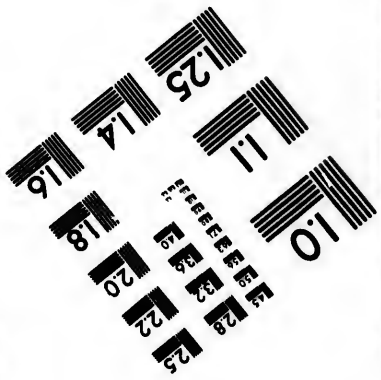

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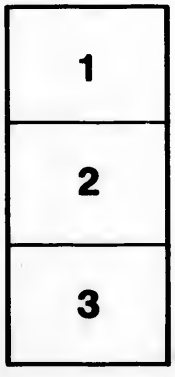

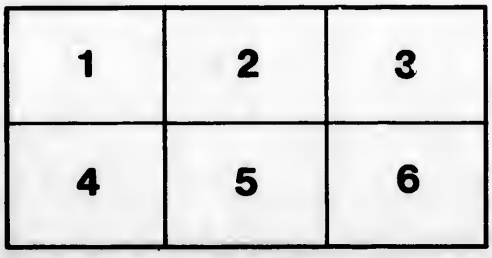

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OUTLINES

OF

FLEMISH HUSBANDRY,

AS

APPLICABLE TO THE IMPROVEMENT OF AGRICULTURE IN CANADA.

ORIGINALLY PUBLISHED BY THE SOCIETY FOR THE DIFFUSION OF USEFUL KNOWLEDGE,

And re-published by the Bureau of Agriculture,
IN FRENCH AND ENGLISH.

Montreal:
PRINTED BY JOHN LOVELL, AT HIS STEAM-PRINTING ESTABLISHMENT,
ST. NICHOLAS STREET.
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BUREAU OF AGRICULTURE,
QUEBEC, *June*, 1855.

THE following Treatise on the "OUTLINES OF FLEMISH HUSBANDRY," now re-printed by direction of the BUREAU OF AGRICULTURE, was compiled by an eminent Agriculturist, at the request of the Society in England for the Diffusion of Useful Knowledge.

The work was strongly recommended to the consideration of the BUREAU by ROBERT S. ATCHESON, Esq., one of the Commissioners of The Trust and Loan Company of Upper Canada, and upon a careful perusal, the propriety of its re-publication will be very apparent. It is eminently practical and concise, clear and simple, and gives an excellent general view of the practice and progress of, perhaps, the most prosperous agricultural country in the world. It contains a fund of information, valuable for the whole country, but especially for the Lower Province, from the similarity in the habits, character, and circumstances of the people to those of the natives of Flanders,—a similarity extending, in many instances, even to the soil, extent and nature of their farms.

In bringing this valuable little work under the notice of the Bureau, Mr. Atcheson remarks, that his motive was simply that of promoting the advancement of the Province, and his conviction that the population of Lower Canada will readily "avail themselves of any opportunity, judiciously presented to them, of acquiring information calculated to advance their own interests, and the improvement and welfare of their country."

A careful perusal of this instructive volume is strongly recommended to the intelligent farmer. The chapter on Select Farms, p. 121, will be found interesting and highly useful,—that of Mr. Doutrelinge, a native of France, near Courtray, especially so. But the attention of the reader is more particularly directed to those parts of the work which relate to the increasing the depth and fertility of the soil by deep ploughing and trenching, the collection and application of manures, and the succession and rotation of crops. They will not only convince him that the average produce of the poorest soils in Canada, those even which have been exhausted by over-cropping and years of neglect, may be *at least* doubled; but will also point out to him, in the plainest manner, the simple means by which that result may be effected.

A Table of Contents has been prefixed, and an Alphabetical Index to the principal matters added, to the original work, for the convenience of reference.

WILLIAM HUTTON,
Secretary, B. A. & S.

CONTENTS.

OUTLINES OF FLEMISH HUSBANDRY.

HUSBANDRY

OF

EAST AND WEST FLANDERS.

INTRODUCTION.

The provinces of East and West Flanders and Antwerp, which form a part of the lately established kingdom of Belgium, were early known as the centre of European manufacture and commerce. When the greatest part of Europe was peopled by nations who had scarcely emerged from a state of barbarism, the mechanical arts already flourished in Flanders. Bruges and Ghent were important commercial towns in the 11th century, and supplied the various courts of the south with the rich silks and tapestries which were then their chief luxuries. They owed this pre-eminence entirely to a persevering industry, which neither a barren soil nor an ungenial climate could repress; and also to a spirit and love of freedom, which existed in few other nations of Europe. Whether the careful cultivation and improvement of the soil is to be considered as the cause or the effect of their commercial prosperity, or, as is most probable, agriculture and commerce grew together, and mutually supported each other, the fact is no less certain, that the poor sandy soils of Flanders soon rivalled the rich plains of Lombardy in those productions which are suited to a northern climate. The husbandry of Flanders is consequently an object of peculiar interest; and in order to account for its progress it is necessary to keep in view the close connexion which exists in that country between the farmer, the manufacturer, and the

merchant, and the effects of a continually increasing population, in stimulating the exertions of those who provide the necessaries of life. Where there is a great extent of land, and the object of the proprietor is to derive some revenue from it, but there is not a sufficient population to create an urgent demand for agricultural produce, the land is always cultivated in a slovenly manner. The simplest means of invigorating the soil, in this case, when exhausted by crops, is to leave it fallow, that the air and rains may restore some portion of fertility, or to let it lie in grass, that is, to allow the plants which naturally spring up in the soil to spread over it, until their roots shall have furnished a fresh supply of vegetable matter to feed a new succession of crops. Both these methods may be useful where no better is at hand; but wherever manure can be obtained at a reasonable cost, this is ever found the most effectual restorer of fertility. In a country with a dense population, where the villages are thickly scattered, or where, by means of water-carriage on rivers and canals, manure may be transported to the land at a trifling expense, fallowing and laying down to pasture must necessarily be suporseded by increased tillage and manuring. This is the case in Flanders. If the whole country were laid out in large farms, and a third or fourth part were fallowed every year, or if one half of it were left in natural grass, the population could not be fed; instead of exporting agricultural produce, as is the case now, the Flemings would require a very great importation to supply the demand for internal consumption. Besides, poor soils, such as are found in the greatest part of Flanders, would never be recruited in this way; without repeated manuring no vigorous vegetation would take place, and the land, instead of improving by being left to nature, as some very rich soils may, would return to heath, its original state.

The agriculture of the Flemings has arisen from necessity, and has been encouraged by an increasing population. Commerce and manufactures have multiplied the objects of cultivation by a demand for them. Hence flax, hemp, oily seeds, and various other plants, often produce a greater profit to the farmer than corn; and thus, by diminishing the quantity of land devoted to the growth of food, enhance the value of the latter. Manure, being greedily sought after, soon became an object of commerce, and in a short time a perfect balance was established between the prices of flax, hemp, oil, &c., and corn, hay, and manure, the last always rising as the produce gave a greater profit, after all expenses were deducted.

These preliminary observations are necessary to enable us to find out the true secret of Flemish husbandry, and also to guide us when we attempt to imitate it. For there is nothing more certain in agriculture, than that any produce suited to the climate may be raised on any land, whatever be its natural quality, provided there be no limit to the expense. The coldest wet soils may be made to produce the plants which usually grow in light sands, by effectual draining, deep ploughing, and the addition of silicious and calcareous earths. The most blowing sands may be fixed and consolidated by clay and pressure, and enriched by dung to such a degree as to produce heavy crops of beans and wheat; but such improvements are made merely as experiments, unless they are dictated by absolute necessity. In most cases the cost would not be repaid by the value of the produce; and consequently, no one who cultivates for profit will have recourse to such expensive means.

When Flanders first began to be peopled, the rich alluvial soils along the rivers were probably the only lands cultivated, and the chief object must have been to protect them against inundations. As the population increased, and towns and villages arose, the lands in their immediate vicinity were soon brought into a state of garden cultivation. The manufacturers found it a relaxation to pass from the loom to the plough; and the bread which was the produce of a little suburban farm was preferred to that which might probably be bought at less cost from the regular farmer. We see instances of this every day in the neighbourhood of our great manufacturing towns. But in the course of time this high and artificial cultivation spread all over the country, and prices naturally adjusting themselves to the cost of production, the whole became an enlarged garden, as it may now be considered. Much, however, of this garden culture may with advantage be applied to a greater extent of ground; and if correct accounts are kept, and the increased return for increased labor and manure be taken into consideration, not for one year only, but for a series of years, we have no doubt but it will be found that the Flemish system of cultivation is economical as well as productive, provided it be followed up systematically, and with a proper knowledge of the principles on which it is founded.

The Flemings do not boast of any great discoveries in the art of tilling the land. They refer to time immemorial for their usages. There is no record or tradition of the introduction of

any particular produce, excepting that of the potato, which they probably obtained first from England. But field-turnips, clover and rape, which we have received from them, have been cultivated there for many centuries. The triennial system which prevailed, and still prevails, over a great part of Europe, has left no traces in the light soils of Flanders, although it is still adopted to a certain extent in the larger farms on the stiff alluvial soils reclaimed from the sea, which they call *Polders*, and also in other provinces of Belgium.

The progress of agriculture has been slow and gradual; and while other nations, and England especially, were continually introducing improvements in cultivation, and new systems of husbandry were proposed and discussed in numerous publications, the Flemings were going on in their old beaten track, like men who have already attained a great degree of perfection in the art they profess. Not a practice has been altered, nor any new produce generally introduced since the potato became a principal object of cultivation, except the white beet-root from which sugar is extracted. Speaking with great impartiality, we may safely assert that, notwithstanding this, the cultivation of a poor light soil, on a moderate scale, is generally superior in Flanders to that of the most improved farms of the same kind in Britain. We surpass the Flemish farmer greatly in capital, in varied implements of tillage, in the choice and breeding of cattle and sheep; and the British farmer is, in general, a man of superior education to the Flemish peasant; but in the minute attention to the qualities of the soil, in the management and application of manures of different kinds, in the judicious succession of crops, and, especially, in the economy of land, so that every part of it shall be in a constant state of production, we have still something to learn from the Flemings; and a detailed account of the mode of cultivation, especially of light lands, in Flanders, cannot fail to be both interesting and instructive.

The object of the following pages is not to make an invidious comparison between the agriculture of the two countries, or between the skill and industry of the two nations, but to draw the attention of agriculturists in general to the principles on which the Flemish practice is founded, so that they may apply them, with proper modifications, to the cultivation of larger farms and other soils, wherever it may be done with advantage; and if the observations we shall venture to make should give hints for the

further improvement of practical Agriculture in either country, we shall not think that we have labored in vain.

It may here be proper to give the reader some account of the sources from which our information is derived. There are few books on Husbandry published in Flanders; if there were, the Flemish farmers would not read them. The only account of Flemish husbandry published in England, as far as we know, besides the short sketch given by Sir John Sinclair, is the Report made to the Farming Society of Ireland by the Rev. Thomas Radcliffe, and published in London in 1819. This work contains much useful information, which several tours through Flanders, made for the purpose of inquiring into its agriculture, have enabled us to verify. But his divisions of the country are inconvenient, and may lead to great mistakes in judging of the soil. His account of the cultivation of each district does not always apply to the majority of soils within it. This is, however, a defect more in a geographical than an agricultural point of view, and we have to acknowledge our obligations to the author in the pursuit of our inquiries. In 1815, Mr. De Lichtervelde, of Ghent, published a small work called *Mémoires sur les Fonds Ruraux du Département de l'Escaut*, which consisted of answers to certain queries made to him by order of the French Government in 1812, in which many particulars are found which had never before been published.

But the work to which we are most indebted, and which we consider almost in every point as of complete authority, is the "Agriculture de la Flandre," written in Flemish by Mr. Van Aelbroek, of Ghent, translated into French, and published at Paris, 1830. This is the only work of any consequence on Flemish husbandry written by a native of Flanders. Mr. Van Aelbroek was, and is still, a considerable proprietor of land, and a man of great experience and information, who during the course of a long life has made agriculture his study and delight. His work recommends itself in a peculiar manner to our notice, for it was suggested by a prize offered in 1818 by the Board of Agriculture in England for "*the best account of Flemish Agriculture*," and may therefore be said to have been written purposely for the British reader. The original memoir was written in French, and transmitted to Sir John Sinclair. From some circumstances, which have never been explained, and the consequent dissolution of the Board of Agriculture, no notice was ever taken of it, nor could

the manuscript be recovered, no answer having been returned to repeated applications for it. The author then recomposed it, in an enlarged form, in Flemish, for the use of his countrymen; and it was soon after translated into French under his own eye. It is much esteemed by the French *Agronomes*, or scientific agriculturists, and has been widely circulated in France. The form of a dialogue, which he adopted, is less interesting to those who rather seek facts than discussions; and this may be the reason why an English translation might not be suited to the taste of the generality of readers of works on Agriculture; but we must here, once for all, acknowledge our obligations to this work for most of the details we have given, which were found to be correct wherever we had an opportunity of verifying them by our own observations and inquiries.

A geographical dictionary has lately been published at Brussels, of all the provinces of Belgium. The Agricultural part is chiefly taken from Mr. Van Aelbroek's work; but there is a short statistical account of every parish, which has been of great use to us.*

CHAPTER I.

OF THE DIVISION OF THE LAND INTO POLDERS AND UPLAND—FORMATION OF THE POLDERS, AND ANALYSIS OF THE SOIL—CULTIVATION—CROPS—SIZE OF FARMS—BUILDINGS, &c.

THERE are two very distinct classes of land in Flanders, of which the formation is evidently different. The first consists of the alluvial low deposits along the rivers and estuaries, which have been reclaimed from the sea by embankments, and to which the name of *Polder* is given. The second comprehends all the lands in the interior, varying in texture and fertility, and situated in an extended plain, slightly undulated and gradually rising above the level of the waters. The polders are formed by the deposits of various earths, mud, and vegetable matter, which are brought down by the rivers, and are suspended in the water so long as it remains in motion, but which are rapidly deposited wherever a

* Since writing the above, we have made another complete tour of East and West Flanders, and had ample means of verifying or correcting every statement which we had made. This has also enabled us to add some account of particular farms, with details communicated to us on the spot.—August, 1837.

stagnation takes place. When a rising tide meets the current of a river flowing into the sea, it checks its course, and ultimately produces a complete stillness, until it again begins to ebb. Here banks of mud are gradually deposited, and the water, flowing off gently, forms narrow channels for itself between these banks, which continually increase, until the sea no longer flows over them, except at high tides. Aquatic plants gradually grow on their surface, and consolidate it; and they very soon become marshy pastures. In this state they are called *Schorres*, which is analogous to our *Saltings* on the coasts of Kent and Essex. But the fertility of this alluvial soil soon tempts speculators to protect the land by embankments from the periodical inundations to which it is exposed; and the speculation is generally very profitable, although the first outlay is considerable. The first thing is to raise dykes which can resist the waters increased by the force of the winds at the highest tides. Where the direct influence of the sea is diminished by the protection of external sand-banks and shoals, a common mud wall or dyke, with a deep ditch on the inner side, carried up some feet above the highest rise of the tide, is sufficient to prevent inundation. The low grounds within the dykes are, however, subject to be flooded by the soaking of the water through the soil, and by the rains. To obviate this inconvenience, the whole is intersected by canals and ditches, which collect the surface water, and discharge it through sluices which are opened when the tide has sunk below their level: should this not be sufficient, windmills are erected, which raise the water artificially to the height necessary to enable it to flow off. These mills are similar to those used in the fens in England. A double spiral in the form of a cork-screw made of boards placed round a strong wooden axle, works in an inclined trough, which is the half of a hollow cylinder cut down the axis. The lower part of the spiral is immersed in a reservoir into which the water flows, and as it is turned round by the mill, it pushes up the water along the inclined trough, and discharges it at the higher level. No machine can be simpler, or do its work more effectually. There is little or no friction; and, with a certain velocity, very little water is lost. Where the polders are very low, and there is some danger of occasional inundation, they are kept in pasture: but they are so much more valuable when cultivated, that every exertion is made to keep out the water. When they are ploughed up, they are found to consist of a very fine soft clay, intimately

blended with a portion of calcareous earth and vegetable matter in a state of decomposition, or more properly, of the substance which is the result of this decomposition, and which has been called *humus*.—(See "Penny Cyclopædia," article *Arable Land*, vol. ii., page 221.) It also contains a portion of silicious sand, without which it would not be so well adapted to the growth of corn, and some finely powdered shells, which also add to the fertility.

In the Dictionnaire Géographique there is the following description and analysis of the soil of the polder of Orderen, in the province of Antwerp, which, although imperfect, because it only takes into the account the mineral substances, and overlooks the vegetable, will, however, give some idea of the nature of the soil:

"The soil is soft to the touch, ductile and tenacious. The microscope discovers no shining particles in it. It does not affect the colour of tincture of turnsol, and is consequently neither acid nor alkaline. When it is kneaded into a mass with water it is plastic, like potters' clay: when baked it forms a brick with a smooth surface: in a strong fire it vitrifies: 48 ounces of the dried soil gave the following result on analysis:—

	Ounces.	Drms.	Grs.		per cent.
"Calcareous sand....	6	1	4	or nearly	13
Silicious sand.....	2	3	10	"	5
Pure clay.....	39	2	6	"	81
White allumina (*)	..	..	16		
Mica.....	..	..	6	"	1
Loss.....	..	1	18		
	48	..	..		100"

An analysis of St. Catharine's Polder is given by Mr. Radcliffe, as follows:—

Allumina.....	52½
Silica.....	21
Carbonate of lime.....	19
Oxide of iron.....	7½
	100

This is not so heavy as the last, and apparently better for wheat, from the proportion of silicious and calcareous earths in its composition. But here also the humus, or vegetable matter, is overlooked, which, however, is the principal measure of fertility in any well constitued soil.

* This was obtained by evaporating the water which had passed through the filtering paper.

Thaer, in his classification of soils (see Grundsätze der Rationellen Landwirthschaft, Berlin, 1809, vol. ii., page 142,) places at the head of his rich alluvial soils one which was found near the mouth of the Elbe. It contains

Fine clay	74
Sand	10
Calcareous earth	4.5
Humus	11.5
	100

If we compare this soil with that of the polder of Orderen, and allow for the omission of the humus, by supposing that it was confounded with the fine clay and calcareous earth, which is very probable,* we shall find a considerable resemblance, sufficient, at least, to give us an idea of great natural fertility in both. When a polder is first embanked, and sufficiently drained to admit of the plough, and be sown, it produces a succession of heavy crops, without any manure whatever. Little attention is consequently paid to artificial means of increasing its fertility. All the straw is sold off the farm, and even the dung of the cattle used for the cultivation of the land, or necessary to the comfort of the farmer, is sometimes sold to manure poorer lands. The whole of the labour consists in ploughing, sowing, and weeding, till the crop is fit to be reaped. The most exhausting crops succeed each other; and in a very few years the land is reduced to the average fertility

* In the usual mode of analysing soils, by means of acids and re-agents, the mineral substances are separated, and their proportions ascertained; but neither the state of division in which the earths exist in the soil, nor the proportion of animal and vegetable matter diffused through it are discovered. It is a chemical analysis, but not an agricultural one. To obtain this last no other agent but pure water should be employed, to separate the earths mechanically by mere washing, diffusion, and deposition. After this the nature of the earths may be chemically examined, chiefly to separate the calcareous from the aluminous earth. The humus is easily separated, being much lighter than the earths and the last deposited from suspension in water. It is distinguished from fine alumina, and from carbonate of lime, by heating it red hot in a crucible: the humus is totally destroyed by fire, but not the earths. A long graduated glass tube is a most useful instrument for ascertaining the nature of soils. A certain quantity is put into the tube, and water is poured on; the whole is well shaken together, and then left to subside. The earths will be arranged according to their size and gravity, the coarser at bottom, and the finer remaining for a longer time suspended in the water. The proportion is thus easily ascertained without a chemical analysis.

of the surrounding districts. It is not in the new polders, therefore, that we are to look for models of husbandry; nor is it our intention to dwell long on the system pursued there, which admits of much improvement.

The usual course consists of five or six crops and a clean fallow. The manure, if required, is usually put on the land in the fallow year only. It consists of every kind of dung mixed in heaps, as it is collected from the stables, and turned over, as we do on similar lands in Kent and Essex. Twenty tons of rotten dung per acre are put on before the seed furrow. The fallows are stirred four or five times in the season: but the first ploughing is seldom given before the spring, from a notion that the land, if ploughed before winter, would imbibe so much wet as to prevent its being ploughed again in spring, and would not then bear the tread of the horses; whereas the solid surface of the stubble allows the water to run off, and the land is sooner fit to be ploughed in spring. There may be some plausibility in this reasoning, but all the benefit of the frost on a compact soil is thus lost; and if they would lay up their stitches in a high and rounded form before winter, and be careful to make artificial outlets for the superfluous water, by numerous water-furrows, there is no doubt but the land might be kept sufficiently dry; while it would derive great benefit from the mellowing effects of the frost and air in winter.

The first crop after a fallow is usually winter barley, of which this land produces great crops when not yet exhausted by over-cropping, or colzat (rape or cole,) from the seeds of which oil is expressed. The next crop is beans or oats, the third, flax with clover seed sown amongst it. The fourth year the clover is cut twice, or the second growth is left for seed. The fifth crop is wheat, after which come potatoes, if the land will bear another crop; if not, it is fallowed, and the rotation begins again. It is evident that land which can bear such a succession of crops must be deep and fertile by nature. If it were better managed at first, and its original fertility kept up by a judicious selection of crops, and occasional recruiting with manure, there is no doubt but it would give a still more profitable return in the end. More frequent green crops would improve the system, and by means of these and careful hoeing, fallows might be altogether dispensed with. At present the number of cattle kept in the polders is too small to make sufficient manure. Good and strong horses are kept to plough the stiff soil, which often requires four horses to a

plough; but the number of cows and sheep is too small; and the manner in which they are fed in winter, chiefly on straw only, does not denote a knowledge of the great value of cattle in husbandry. Whether the soil be not too heavy for common turnips, we will not pretend to determine, but the Swedish turnip or ruta baga, mangel-würzel, white beet-root, and cabbages would thrive well in it. With these a considerable stock of cattle might be kept in good condition in winter, if not absolutely fattened.

The farms in the polders are much larger than in the uplands; 200 acres is not an uncommon tenure; and although this may seem but a small farm to many an English and Scotch farmer, it is a very large one in Flanders, where from 20 to 50 acres are thought as much as one man can well manage. The produce of 200 acres of polders is very considerable in good years, even with an imperfect mode of cultivation.

Labour is comparatively dear in the polders. The air is unhealthy, and the population thin. Strangers and all who are not habituated to the climate, and who are accustomed to breathe a purer air in the interior, invariably suffer from agues; hence those who are seasoned are in request and paid accordingly.

The quantity of seed sown in the island of Catsand, which is of the richest kind of polders, and the average returns, are given by Mr. Radcliffe as follows, reduced to English measures:—

Crops.	Seed per Acre.	Produce.
Winter Barley....	69 lb. or 1¼ bushel.....	45 bushels
Rape or Colsat....	5 to 7 lb.....	40 "
Wheat.....	2 bushels.....	30 "
Rye.....	2 do.....	38 "
Beans.....	2½ do.....	39 "
Oats.....	3 do.....	58 "

Wheat is here the least productive crop; and winter barley is often far more productive than is here stated, especially on new polders, where 70 to 80 bushels per acre are sometimes reaped: and barley is often sown twice in succession, the second crop being sometimes equal to the first. The quantity of seed sown is less than in England, but more than in some other parts of Flanders, where the soil is much inferior. Great pains are taken to choose good seed; and when it is sown, it is carefully covered with earth dug out by the spade from the intervals between the stitches, and, in light soils, well rolled, or trod in with the feet. Thus all depredation from birds is prevented, and every seed

springs up; a good preparation of the soil ensures the vegetation, and the plants tiller out abundantly in a rich and mellow surface. The rents are moderate, compared with the produce: there is less competition for farms in an unhealthy district, and seasoned tenants are not readily parted with. The farm buildings in the polders are substantial and convenient. There is a great appearance of comfort in the farmers' houses. The greatest cleanliness prevails everywhere. The polder farmer leads a retired life with his family, having little communication with the towns or more populous parts of the country. For a great part of the year, especially after rain, the roads are deep and almost impassable. The canals, where any of them lead to towns, are the chief means of communication.

There is a practice in the polders which somewhat resembles the Irish Con-acre. Labourers hire portions of land, ploughed and manured by the farmer, who lets it to plant potatoes in, or to sow flax. A very high rent is paid for these. The labourer plants his potatoes, or sows his flax; his family weed and hoe the crop, and gather it in at harvest; and both farmer and labourer gain by the bargain. The potatoes help to keep the family and a cow and pigs during the winter. The flax is prepared and spun at home, and the whole produce is brought to good account.

There is a mode of letting land mentioned by Mr. Van Aelbroek, which is a remnant of the old métairie system. On a farm of 200 or 300 acres, one-third is let with the buildings at a fixed rate; the tenant engages to cultivate the remainder on a joint account with the proprietor; that is, he does all the labour, and the crop is sold on the ground, the price being equally divided between them. This arrangement can only take place where the land requires no manure and little labour. No more effectual way could well be divised of completely exhausting the soil.

We will now take leave of the polders, and proceed to the description of the more varied and interesting cultivation of the different soils in the interior.

CHAPTER II.

OF THE VARIETY OF SOILS IN THE INTERIOR—PROBABLE FORMATION OF THEM—ANALYSIS OF THE POORER SANDS—RECLAIMING OF HEATHS—TRENCHING—LEVELLING—MODE OF CULTIVATION, AND GRADUAL IMPROVEMENT.

THERE are few countries in which the soil varies so much as in Flanders, retaining at the same time a similarity of composition. The chief distinction is between the light sands and heavy loams. On digging to some depth in any part of the country, alternate layers of sand and loam, or clay, and sometimes peat, are found disposed horizontally, but very irregularly, and with rapid and sudden interchanges. According as the uppermost stratum is a silicious or argillaceous loam, so the soil takes its quality of light or heavy; and these are so intermixed that every variety and gradation of soil may often be found in a field of a few acres.

It appears probable that the rivers which discharge their waters into the sea through the coasts of Belgium and Holland have often changed their beds, as is always the case on a flat coast. The rivers and the tide, meeting, form sand-banks, called bars, which frequently obstruct the current. New channels are then formed around them. The sand-bank is gradually covered with a deposition of mud, as in the formation of the polders: and this, at some future period, may have the sea-sand again accumulated over it, when the whole level of the river has risen, and all the old channels are filled up. Thus the land is raised, and the shores advance towards the sea. A simple inspection of all large rivers, where they discharge their waters into the sea, clearly shows this to be the natural progress by which the flats and deltas at their mouths are formed; and this will naturally account for the alternations of barren sand and rich loam, and every possible mixture of the two.

The fertility of the polders and of some deep rich loams in the province of Hainhault and in a few spots in Flanders, has given rise to the notion that the fine crops generally observed through the whole of Belgium are owing chiefly to a very superior quality in the soil. Travellers hastily passing through the country, and observing the abundant harvests, naturally adopt this opinion. But nothing is farther from the real fact. The rich parts of Flanders are but few in comparison to the poor, as an attentive examination and analysis of the soil will clearly show. The average fertility of the land in the provinces of East and West Flanders and

Antwerp will be found much below that of our inland counties, leaving Essex and Kent out of the question. If a fair comparison were made, it should be with the poor light soils of Norfolk or Lincolnshire, where industry and the application of capital have overcome the natural poverty of the land, and made it highly productive.

There are, no doubt, some very good lands in Flanders, besides the polders, but the greater part have been reclaimed from a state of barren heath and waste, and would soon return to their original state if neglected for a few years. But the industry and perseverance of the inhabitants are only the more conspicuous and praiseworthy, and make the inquiry into their mode of reclaiming barren heaths, and fertilizing them, the more interesting and instructive.

The poorest soil is to be found in the province of Antwerp, the only province of the three where there are still to be found heaths of any extent. These are situated on the confines of the kingdom of Holland. The soil is a coarse silicious sand, containing a few particles of a black inflammable matter like peat, which gives the sand a greyish colour, from which it derives the name of grey sand; such a sand, taken from the heath at Braschaet, and analysed, contained, according to the "Dictionnaire Géographique," in 48 ounces of the dried soil,—

	Oz.	Drs.	Grs.
Coarse silicious sand.....	42	2	16
Fine sand mixed with peat	3	5	36
Combustible peat.....	2	5	19
Small fibres of roots.....	..	2	10
Loss	..	..	29
	—	—	—
	48	..	..

This sand is evidently quite barren in its nature, and it is only by incorporating it with clay or loam, which is frequently found in the subsoil, that it can be made to retain sufficient moisture to keep up vegetation. Water runs through it as through a filtering stone, and sinks till it meets an impervious subsoil, where it necessarily stagnates. But when mixed with a loamy subsoil by deep trenching, it becomes capable of retaining moisture; and by means of manure a scanty vegetation is forced. The roots of hardy plants being once established, the soil gradually improves, and in a few years, by incessant labour and perseverance, it becomes somewhat fertilized.

There is another kind of sandy soil which is also found in the heaths, but which is of a better quality. It is called soft, or sweet, yellow sand. It is of a finer texture, and contains some oxide of iron, which gives it the yellow colour. It is said to consist of

	Oz.	Drs.	Grs.
Loose yellow silicious sand	36	4	28
Finer sand mixed with clay	4	3	89
Fine alumina.....	6	6	48
Loss.....	..	1	5
	48	..	..

This sand is much superior to the grey, and with moderate manuring will produce rye, flax, clover, potatoes, oats, and with good management, even wheat.

The next in order ascending towards rich soils is the sand found in the Waes district of East Flanders. Of this Mr. Radcliffe has given an analysis. It was taken from the neighbourhood of St. Nicholas. But, as we observe before (page 12,) the analysis is imperfect from the omission of the humus, to which it owes its fertility, the component parts by no means indicating a fertile soil. These are

Silex.....	84
Alumina	13
Oxide of iron.....	3
	100

If we look at Thäer's classes of soil, we shall find that such a soil is placed as low as the 17th, which he values at only 15 per cent., or about one-seventh of the first, or rich wheat land. But if we suppose, as is the case, that the silex is very fine, and intimately blended with a good proportion of humus, it will become a rich sand. It is well known that the sand of the Waes district requires less manure, and produces finer crops than any other sandy soil in Belgium.

When the proportion of alumina is less than one-fourth of the silica, the soil may be called light; if it is half of the silica, it becomes a good loam, fit for wheat: such a soil is found at Swevighem, near Courtray: its analysis gives, according to Radcliffe,

Silex.....	63·5
Alumina.....	35·
Carbonate of lime.....	0·5
Vegetable fibre.....	0·5
Oxide of iron.....	0·5
	100

When a soil contains 40 per cent. of alumina, it may be ranked amongst the stiff heavy soils, such as that which is found near Ninove and Alost: when it exceeds this, the Flemish farmer thinks it too stiff, and requiring to be improved and lightened by lime. The soil near Oustzeele, of which the following analysis is given, is of this kind:—

Silex	49
Alumina	48½
Oxide of iron	2½
	100

This land requires chalk or lime to make it productive, and these are not found in East Flanders. It is a peculiarity of the Flemish soils, that they scarcely contain any carbonate of lime. The only soil which contains calcareous matters is that of the polders, where it consists of finely comminuted shells. It appears that where alumina greatly abounds it requires to be tempered with a large proportion of carbonate of lime and humus, to be fertile. No such soil, however, is to be found in the interior of Flanders. The skill and industry of the Flemish farmers is consequently directed chiefly to the improvement of light lands and good loams. When they speak of a heavy soil, it is to be understood merely as a good stiff loam, not too heavy even for turnips: as to the cold wet clays, such as we have in parts of England, they know little of them; and the few spots which are of this nature are left in poor pasture, or produce inferior woods and coppice, not being thought worth the expense and trouble of cultivation. There are some places, however, in West Flanders, where, for want of better soil, they are forced to cultivate cold clays; and the method adopted is good, viz., very deep ploughing, liming and manuring abundantly: under-draining is little understood, but might be introduced with great advantage.

The poor sandy heaths which have been converted into productive farms evince the indefatigable industry and perseverance of the Flemings. They seem to want nothing but a space to work upon; whatever be the quality or texture of the soil, in time they will make it produce something. The sand in the Campine can be compared to nothing but the sands on the sea shore, which they probably were originally. It is highly interesting to follow step by step the progress of improvement. Here you see a cottage and rude cow-shed erected on a spot of the most unpromising aspect. The loose white sand blown into irreg-

ular mounds is only kept together by the roots of the heath: a small spot only is levelled and surrounded by a ditch; part of this is covered with young broom, part is planted with potatoes, and perhaps a small patch of diminutive clover may show itself: but there is a heap of dung and compost forming. The urine of the cow is collected in a small tank, or perhaps in a cask sunk in the earth; and this is the nucleus from which, in a few years, a little farm will spread around.

In another spot more extensive improvements are going on: a wealthy proprietor or lessee is trenching and levelling the surface, sowing broom-seed, and planting young fir-trees, which are to be cut down in a few years. In another, the process has gone on further, the firs or the broom are already cut down; a vein of loam has been found, and is dug out to be spread over the sandy surface: the cart with liquid manure is preparing the surface for the reception of seed, or the same, diluted with water, is poured over the young blade just appearing above ground. The soil is created and, if the cost and labour were reckoned, is paid for at a dear rate: but perseverance insures success, and there are few instances of improvements being abandoned after they are fairly begun, unless they were undertaken on too large a scale; but then the land is soon divided into smaller portions, and improvements go on from different centres, and with more certainty.

We are here describing the labour of bringing a soil absolutely barren into a state of cultivation; but in most of the districts which have been originally waste and covered with heath, and which are now fertilized, a less ungrateful soil was found. Deep trenching and levelling at once presented a surface which required only to be manured to produce rye, flax, and potatoes. This is what we should call a moderately good sand, in which a small portion of clay and oxide of iron produces a certain degree of compactness, so as at least to retain moisture: under this kind of sand a stratum of loam is usually found at the depth of two or three feet, and almost invariably between the sand and the loam an indurated crust of earth cemented by carbonate of iron, which is well known to all improvers of poor sands by the name of the *iron pan;* this pan must be broken up, and the loam under it mixed with the sandy surface, before any cultivation can succeed; and in this operation the Flemings are very dexterous. The instrument they use is a light wooden trenching spade, the end of the blade only being shod with iron: the handle of this spade is

about two feet long, the blade from twelve to fifteen inches. A light pick-axe is used to break the pan where it appears. A ditch is dug with the trenching spade two or three feet wide, and as deep as the trenching is intended, generally two feet, or at least twenty inches; this ditch is filled with the earth which is taken in long thin slices from the edge of the solid side of the ditch. Every slice is distributed carefully, so as to mix the whole, and keep the best soil at top, and likewise to fill up hollows, and level eminences. If there is more than can conveniently be spread level, little heaps are made of the superfluous earth, which are afterwards carried, in an ingenious manner, to fill up more distant hollows, by means of horses and an instrument which is called a *Mollebart*, of which a description will be given hereafter. Wherever there is a pan, it is carefully broken, and the loam, which is always found under it, is mixed with the sand dug out. Draining is seldom required here, except that which is effected by making deep ditches to carry off the superfluous rain-water, which, in a country almost as level as a lake, is no great difficulty. A canal near at hand is, however, an essential condition of extensive improvement, to bring manure, and carry off the produce of the land, as well as to be an outlet for the water in the ditches. When Count Chaptal traversed a barren part of Flanders, accompanying the Emperor Napoleon, the latter expressed his surprise, at a meeting of the Council of the Department, that so great a tract of land remained uncultivated in so industrious a nation. The answer was, "If your majesty will order a canal to be made through this district, we pledge ourselves that in five years it will be all converted into fertile fields." The canal was ordered to be made without delay, and in less time than they promised not an unproductive spot remained.—(See Chaptal, "Chimie appliquée à l'Agriculture," vol. i., page 347.)—One great cause of the agricultural prosperity of Flanders is the ready transportation of manure and produce by canals.—But to return to the newly trenched land. If there is no manure at hand, the only thing that can be sown on poor sand, at first, is broom: this grows in the most barren soils; in three years it is fit to cut, and produces some return in fagots for the bakers and brickmakers. The leaves which have fallen have somewhat enriched the soil, and the fibres of the roots have given a certain degree of compactness. It may now be ploughed and sown with buckwheat, or even with rye without manure. By the time this is reaped some manure may have been collected, and a

regular course of cropping may begin. As soon as clover and potatoes enable the farmer to keep cows, and make manure, the improvement goes on rapidly; in a few years the soil undergoes a complete change: it becomes mellow and retentive of moisture, and enriched by the vegetable matter afforded by the decomposition of the roots of clover and other plants. It is surprising that so few sheep should be kept on these new farms. Sheep folded would do good by their tread as well as their manure, but the management and feeding of sheep is a part of husbandry in which the Flemings, with very few exceptions, are decidedly as much behind our light land farmers, as they are before us in the feeding of their cows, and preparation and economy of manure.

If about twenty small cart-loads of dung can be brought on each acre of the newly trenched ground, the progress is much more rapid. Potatoes are then the first crop, and generally give a good return. The same quantity of dung is required for the next crop, which is rye, in which clover is sown in the succeeding spring; and a small portion is sown with carrots, of which they have a white sort which is very productive and large in good ground, and which, even in this poor soil, gives a tolerable supply of food to the cows in winter. Should the clover fail, which sometimes happens, the ground is ploughed in spring, and sown with oats and clover again. But if the clover comes up well amongst the rye stubble, it is cut twice, after having been dressed with Dutch ashes early in spring. It is mostly consumed in the green state. The clover-ley is manured with ten cart-loads of dung to the acre, and rye sown again, but not clover. After the rye comes buckwheat without any manure; then potatoes again, manured as at first, and the same rotation of crops follows. It is found that the poor land gradually improves at each rotation, from the quantity of dung used: and, as this is essential, it will be easily seen that without water-carriage the improvement could not go on, for the necessary quantity of dung could never be brought to the ground by land-carriage through the deep sandy roads, which are mere tracts.

For want of sufficient manure, broom-seed is sometimes sown with the rye after the clover. The rye is reaped, and the broom continues in the ground two years longer. It is then cut for fuel. The green tops are sometimes used for litter for the cows, and thus converted into manure. It is also occasionally ploughed in when young and green, to enrich the land. Oats, clover, and

broom are occasionally sown together. The oats are reaped the first year, the clover and young broom-tops the next, and the broom cut in the third. This is a curious practice, and its advantage appears rather problematical. All these various methods of bringing poor sands into cultivation show that no device is omitted, which ingenuity can suggest, to supply the want of manure.

After the land has been gradually brought into a good state, and is cultivated in a regular manner, there appears much less difference between the soils which have been originally good, and those which have been made so by labour and industry. At least the crops in both appear more nearly alike at harvest, than is the case in soils of different qualities in other countries. This is a great proof of the excellency of the Flemish system, for it shows that the land is in a constant state of improvement, and that the deficiency of the soil is compensated by greater attention to tillage and manuring; especially the latter. The maxim of the Flemish farmer is, that "without manure there is no corn—without cattle there is no manure,—and without green crops and roots cattle cannot be kept." Every farmer calculates how much manure he requires for his land every year. If it can be bought at a reasonable rate he never grudges the outlay. If it cannot be purchased it must be made on the farm. A portion of land must be devoted to feed stock, which will make sufficient manure for the remainder: for he thinks it better to keep half the farm only in productive crops well manured, than double the amount of acres sown on badly prepared land. Hence also he does not reckon what the value would be of the food given to the cattle, if sold in the market, but how much labour it costs him to raise it, and what will be the increase of his crops from the manure collected. The land is never allowed to be idle so long as the season will permit anything to grow. If it is not stirred by the plough and harrows to clear it of weeds, some useful crop or other is growing in it. Hence the practice of sowing different seeds amongst growing crops, such as clover and carrots amongst corn or flax; and those which grow rapidly between the reaping of one crop and the sowing of another, such as spurrey or turnips, immediately after the rye is cut, to be taken off before wheat-sowing. These crops seem sometimes scarcely worth the labour of ploughing and sowing; but the ploughing is useful to the next crop, so that the seed and sowing are the only expense; and while a useful crop is growing, weeds are kept down. These are the general principles of Flemish Husbandry. Before

we enter into the particulars, we may give a short account of the instruments in use, which are few and simple.

CHAPTER III.

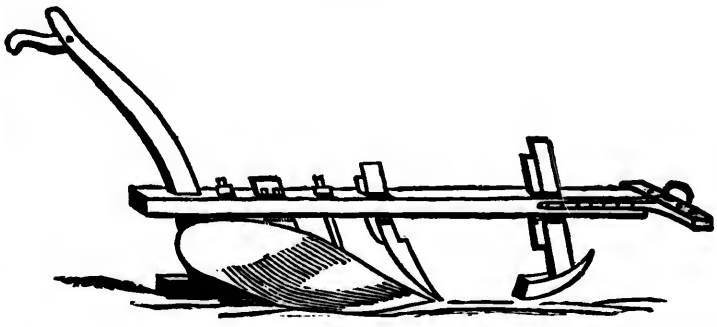
IMPLEMENTS OF HUSBANDRY—MODE OF PLOUGHING.

The spade and shovel are used much more extensively in Flemish cultivation than they are in other countries. Manual labour is not spared. The trenching spade, which we mentioned in the last chapter, is used in the old improved lands as well as in those first reclaimed from the state of waste. All the light lands in the Waes district are trenched twenty inches deep or more, every six years, and all idea of fallows is abandoned. The intervals between the stitches, where the ground is ploughed in this manner, that is in the heavier loams, are all done out with the spade and shovel, as neatly as the intervals between asparagus-beds are in a well-managed garden.

The Flemish hoe with which they hoe and mould up potatoes is much longer in the blade than those in use in Britain. It resembles a small spade with a handle bent at an angle of 60° to the blade: it is a very efficient instrument, and is used for many purposes where spade work would be too tedious.

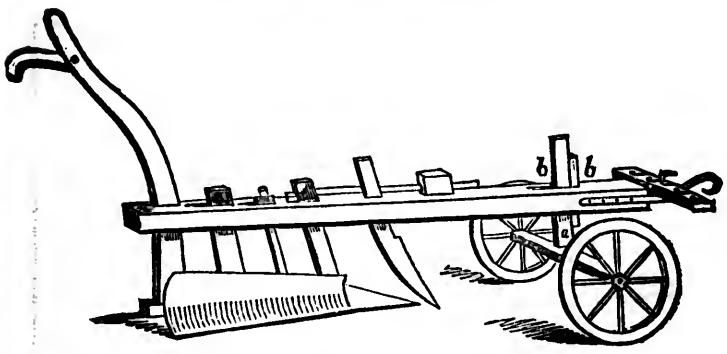
There are two kinds of ploughs in use, differing from each other as much as can well be imagined: these are the old Walloon plough, which is our heavy Kentish turnwrest-plough with wheels and the light single-handled Belgian swing-plough, called there also a foot plough, as it is in some parts of England (see fig.) This, which is the model of the Rotheram plough, is the parent plough

Fig. 1.



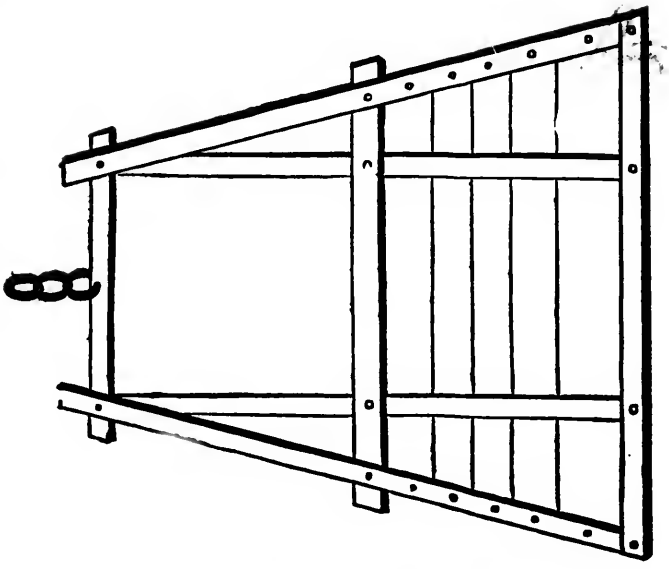
of all our most improved swing-ploughs for light soils. The turnwrest-plough is in use in the polders, and in some few heavy-land farms in the interior; but it is almost entirely superseded by the swing-plough, which, when made somewhat stronger, is found to work equally well in strong loams as in light sands. It must, however, be remembered, that in Flanders a soil is called heavy, which would be called comparatively light in many parts of England, as in Kent and Essex, and which is light enough for turnips. The Belgian swing-plough (fig. 1) acts on the principle of a shovel. The share is very broad: the sole is a kind of sledge, formed by the end of the share towards the heel, and the lower edge of the turn-furrow. This last is made of a sheet of wrought iron about half an inch thick, and bent as if it had been rolled round a cylinder. The fore-part of the share is sharp on the right edge, and spreads to the width of ten or twelve inches where it joins the turn-furrow, which is here very-slightly inclined to the horizon, so as to slide under the furrow slice, and lift it up before it turns it over. The upper edge of the turn-furrow winds in a regular curve from the left side of the point of the share, till it forms an angle of 45° with the horizon on the right hand of the ploughman, laying the slice turned over at that angle against the preceding slice. The handle or horn is nearly vertical, slightly bent, and tapering at the end. It has a horizontal projection on the hinder part, shaped so as to be easily grasped in the hand, by which the whole plough is readily held, and lifted out of the ground, at the end of the furrow, to enter it into the next. The whole is so light and of so easy draught, that in light lands a single horse is sufficient to plough an acre in a day to the depth of six or seven inches. When the day's work is done the point of the share is let into a hook fixed on a little sledge which carries the plough; the ploughman then mounts the horse, and trots briskly home. He returns to the field in the same way in the morning.

There is a variety of the turnwrest-plough, used near Roulers, much lighter than the great Walloon plough (see fig.) It has two small wheels which are connected with the beam of the plough by a small bar of iron (*a b*), which rises from the middle of the axle at *a*, and goes through a mortice in the beam at *b*; it regulates the distance of the beam from the centre of the axle, while this last can take any position, with respect to the horizon, which may be required to keep the connecting bar in a perpendicular position, when one wheel is in the furrow, and the other on

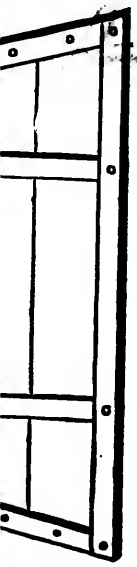


the unploughed land. This is effected by means of a pin (at *a*), which passes through the axle and the end of the bar, and forms a joint like that of the beam of a balance. The length of the beam of the plough is six feet. The sole is nearly half of this length, and the wheels are only eighteen inches before the insertion of the coulter. The whole is nearly as light as the swing-plough, and is of great use in breaking up clover-leys.

Besides these ploughs, they use light harrows with wooden tines set at an angle forward in the cross bars of a triangular frame, which is drawn by the angle towards which the tines are inclined, when the object is to bring up weeds; but from another angle, when it is used to cover the seed, or to smooth the surface after the seed has been lightly ploughed in. Rollers of various sizes, some of stone, but generally of wood, are used to roll the crops in spring, and settle the roots in the ground; but the large heavy roller for grass-land is not in use, although it would be very advantageous in compressing loose meadows, and levelling their surface for mowing. There is an instrument peculiarly Belgian, called a *traineau*, or sledge (see fig.) It is a frame of wood covered with planks, which is drawn along the land, to break clods, and to leave a smooth surface. It is very effectual in doing this, and is useful in loamy soils: its effect is somewhat like a combination of a bush harrow and a roller. Iron teeth put in obliquely in one or more rows are sometimes added to this traineau in stiff soils, to break the clods. The man or boy who drives the horse which draws the traineau usually stands upon it, and by his weight keeps it level. The frame of a roller is sometimes made so that it rests and drags on the ground, and acts like a traineau in breaking clods before the roller. A strong rodded hurdle is also used as a bush harrow, to level the surface in light lands.



Besides the common scythes, hoes and rakes, there is a peculiar instrument for cutting corn, called the Hainhault scythe, of which notice has been taken in many agricultural publications. It is a very useful instrument, and in the hands of an experienced person will cut a third more corn, in the same time, than can be done with the reaping hook. It is a short scythe, of which the blade is broad and about twenty inches long. The handle is about the same length, and fixed so to form an acute angle with the blade, when in the act of cutting; it is bent outward at the end where it it is held, at an angle of about 120°, and is there shaped like the stout handle of a knife or turning tool. It should be so constructed, that, when the blade lies flat on the ground, the man's hand is nearly perpendicularly over the centre of the curve of the blade, so that he can swing the instrument, by a motion of the wrist, without stooping. A leathern strap doubled and nailed on the handle, in which he puts the fore finger, prevents its slipping from his grasp. In the left hand he holds a light stick three or four feet long, having an iron hook fixed at the end, bent into a semicircle of about eight inches diameter. With this hook he collects the standing corn, and lays it towards the left, while the right hand cuts it close to the ground. The cut corn leans against that which is standing; and when as much has been cut as will make half a sheaf, the workman turns half round, and hooking up part



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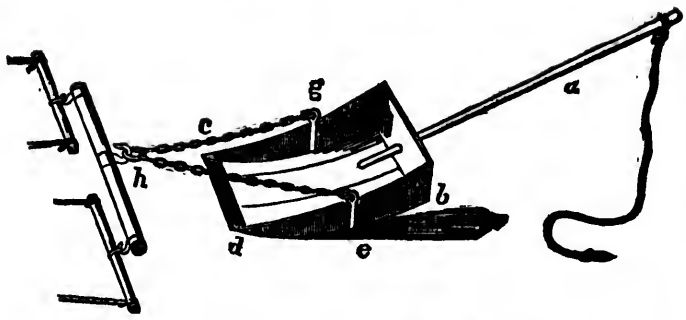
of what is cut with as much of what is standing, he cuts and rolls up the whole in the form of a sheaf, using his leg and foot to keep it in the bend of the blade: the legs are protected by pieces of strong leather over the shins. Thus it is laid down for the binders. Those who are accustomed to the method of fagging in use in Middlesex, Surrey, and the neighbourhood, where straw is valuable, will readily see that this scythe is only an improved fagging hook, allowing the reaper to stand upright at his work, and saving that fatigue of the back which is the chief inconvenience of fagging. For women, to whom stooping is not so laborious, the fagging hook may perhaps do the work as conveniently. But, in Flanders, women only tie up the sheaves, and seldom reap. This instrument has been often recommended for use in England; and we have ourselves made presents of it to reapers who cut by the acre. Very few had the patience to become dexterous in the use of it, and after a few trials returned to the old fagging hook, although it was evident that it would, if properly managed, cut one-third more corn, at least, in the same time. It is, however, inferior in expedition to the cradle scythe in the hands of a skilful mower. This last is also used in Flanders, but not so commonly as the foregoing.

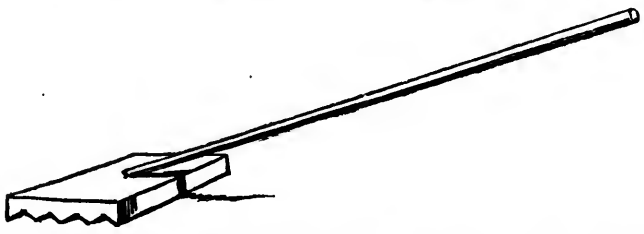
The Mollebart, the use of which, in the levelling of newly trenched land, has been before mentioned, is an instrument peculiarly Flemish or Dutch. It is simply a very large wooden shovel, in form like the tin dust-pans used by housemaids, with a stout long handle. (See next page.) The bottom, which is convex, is covered all over with thin iron plates; and a stronger piece of iron (*c d*) forms the edge. The handle (*a*) is six or seven feet long, firmly fixed to the shovel, and so placed that when the end is raised five or six feet high, the only part of the instrument which touches the ground is the edge (*c d*). When it is held three feet from the ground the shovel rests on the convex bottom (as at *e*), with the edge rising a few inches above the ground; and when it is pushed quite down, and it drags on the ground, the instrument rests on the hinder part of the bottom (*b*). The width of this shovel is about three feet, and the length from the insertion of the handle to the sharp edge is nearly the same. Sometimes it is wider than it is long. In the middle of the border on each side is a strong iron hook (*g*), which is connected with the iron on the bottom. It is drawn by chains fixed to these hooks, united into a large link (*h*) a little before the edge of the instrument. To this



link are attached a common whipple-tree and bars, to which two horses are yoked abreast. Attached to the end of the handle is a strong rope of the size of a man's little finger, fourteen or fifteen feet long. This the driver holds coiled in the same hand which holds the handle, the reins being in the other. It is now ready to begin its operations. The man depresses the handle, so that the edge of the shovel rises upwards, and directs the horses towards a heap or an eminence to be removed. As soon as they reach it the handle is raised, the edge of the instrument enters the ground, or the bottom of the heap, and it is soon filled with loose earth. The handle is immediately depressed, and the whole load slides on the bottom of the shovel over the sandy surface until it arrives at the hollow which is to be filled. The handle is then raised suddenly as high as the man can reach; the edge catches the ground, and the whole machine is overturned forwards, the handle striking on the whipple-tree; the load is thus left behind. The rope, of which the workman kept the end fast in his hand, now comes into use, and by pulling it the instrument is again reversed, and proceeds empty for a fresh load. All this is done without the horses being stopped for a moment. A skilful person will spread the earth at the same time that he deposits it: this is done by holding the rope so that the handle shall not fall over at once, but remain for a short time in an erect position. The earth is thus delivered gradually, and laid level by the edge of the instrument scraping over it. It is astonishing how much labour and time are saved by using this instrument instead of carts. It takes up about 500 cwt. or more of earth each time, and this load slides along with the greatest ease to the horses: in returning they generally trot. More complex instruments have been invented to answer the same purpose, some of which are extremely ingenius, but the simplicity of this, and the small expense at which it may be made by any

common wheelwright or carpenter, or even by the farmer himself, strongly recommend it; and we do not hesitate to assert, that, with a very little practice, any common labourer who can manage horses will do as much work with this simple instrument as he would with the more perfect and ingenious machine, which obtained a prize from the Highland Society some years ago.

Instead of the common flail to thresh the corn, another instrument is used in the Waes country and some other districts, which is of a peculiar form (see fig.): it consists of a solid block of hard wood, about ten inches long, eight wide, and three thick, in the lower part of which there are angular groves cut, about an inch and a-half deep: a stick like the handle of a flail is inserted obliquely into this block, so that when it is raised and struck on the



floor it falls with the grooved surface flat on the corn which is laid down tied up in sheaves. It beats off the chaff as well as the corn, and detaches it from the straw, which the flail does not do so completely. This chaff is mixed with the boiled food for the cows.

Besides the above-mentioned, the Flemish farmers use very few instruments, and they have not adopted any of the new inventions which are used in England. They have no drills, horse-hoes, scarifiers, nor threshing machines; they use the winnowing machine, but the common fan and riddle are still very generally employed to clean the corn when threshed.

In ploughing the land, in some districts they lay it flat, without divisions. In others, as the Waes district, the fields are all laid in a convex form when they are trenched, and kept so by ploughing round in a circle upwards towards the centre. Where the loam is not very pervious to water, they lay the land in stitches seven or eight feet wide, as is usual with us. They plough across the stitches occasionally, and reverse the crown and furrow, or change the interval so as to be in a different line every year, which in the end tends to deepen the whole soil. The depth of the furrow varies according to seasons and circumstances, and there is

much skill and ingenuity displayed in doing this so as to divide the ground well, and lay the dung where it is most effective. When weeds are to be destroyed a very shallow skimming is thought sufficient. In autumn the dung is ploughed in a few inches deep only, to allow the access of air to decompose it. In the following spring the furrow is several inches deeper, to bring fresh earth to the surface without uncovering the dung. When a first ploughing has been very deep to bury weeds, the next is often shallow to divide the slice first turned over, and not bring up the seeds again within the influence of the atmosphere, which would cause them to spring up.* In all this there is a great attention paid to every operation, that it be performed most effectually. No more ploughings are given than are thought essential to each particular crop. A great object is to have an early harvest, both because the weather is generally driest and best early in summer, and because a second crop may be sown before the midsummer showers. Winter barley is on this account preferred to spring barley; and rye is sown early, that turnips may be sown with some chance of success, immediately after it is reaped. Summer stirring and liquid manure keep the land in a clean and rich state, and it is not allowed to remain idle. The heavier soils are laid up high before winter; the intervals between the stitches are well dug out with the spade, and numerous water-furrows are dug across them, that no water may stand anywhere after rains. The winters are more severe on the continent than in Britain; and even in Flanders, which is so near to us, the frost is much longer and more intense. But this is taken advantage of to expose stiff soils to its influence.

They have a practice in some parts of Flanders of digging out spits of earth with the spade from the bottom of the furrows, after the plough has passed, and setting them up on the surface already ploughed. This is done by several men before the plough returns and fills the cavities thus made with the earth of the next furrow. These clods are left exposed to the air and frost, and are afterwards levelled down with the harrows. Mr. Van Aelbroek, with whom this is a favourite operation, calls it the atmospherical manuring, which he thinks equal in effect on the soil to half the usual coat of dung. Whether the advantage be as great as he represents it or not, we will not venture to decide; but it tends to make the soil mellow and friable, and then the manure put on will have a greater effect, and a smaller quantity will be required.

* It is evident that the furrow slice must, in this case, be turned quite over, and laid flat, and not leaning on the preceding, as in ordinary ploughing.

CHAPTER IV.

OF THE DIFFERENT KINDS OF MANURE, AND THEIR APPLICATION.

The collection and application of manure is the great secret of Flemish Husbandry. Upon their poor light soils nothing could be raised without an abundance of manure. It is consequently an object of minute attention to the Flemish farmer to collect as much as possible, and to apply it in the most advantageous manner. For this purpose the dung of the different domestic animals is generally kept separate, especially that of cows from that of horses; the former being thought better for dry sandy soils, the latter for colder loams and clays. They look upon pigs' dung as cold and inferior, adopting in this respect the opinion of the ancients. We think differently; but this may be easily accounted for. The Flemish store-pigs are fed in the most miserable manner, and are merely kept alive on weeds taken from the fields, or by very scanty grazing in rough pastures. We need not be surprised therefore that their dung is poor. The cows are better fed, and their dung is consequently richer. Cow dung is thought to last longer in the soil, and its effects on the second crop are more conspicuous than that of horse dung, which stimulates more, and is sooner effete. Sheep, which are so important to the light-land farmer in England and Scotland, for their manure, are not kept in sufficient quantities in Flanders, nor well enough fed to do much good to the land. They are commonly housed every night, and driven about in the day to gain a scanty subsistence along the roads and sides of fields. The manure collected in the sheep-fold is carried out on the land, and its effects are duly appreciated. A flock is occasionally folded on a clover ley before it is ploughed up, but never on the turnips, which are always given to the cows. This is owing to the small extent of the farms, which do not allow of a considerable flock of sheep being kept by any one farmer; but a flock is made up of different lots of sheep belonging to several proprietors, and put under the care of a common shepherd, or it is sometimes the property of the shepherd, who occupies no land, but lets out the sheep to fold, or sells the manure.

But the great auxiliary of the Flemish farmer is the URINE TANK, wherein are collected not only the urine of cows and horses, but also the drainings of the dung-hills. The urine tanks are generally sunk below the level of the ground, and have the sides

built of brick, and the bottom paved: they are of various dimensions, according to the number of cows and horses on the farm. Attached to the distilleries, where many beasts are constantly kept, to consume the refuse wash, there are very large urine tanks of an oblong shape, divided by partitions into different chambers, so that the liquor may be of the proper age when it is used, which some farmers think ought to be six months. Each chamber is about eight feet square, and six or eight feet deep: these are sometimes vaulted over, but frequently only covered with loose boards. As urine and the emptyings of privies are sold wholesale and retail, there are many large tanks near the rivers and canals, where the dealers have sometimes great quantities in store. Some of these consist of many square pits like tan-pits, bricked round, and the inside covered with a cement, which prevents loss by filtration. There is generally in a corner of each pit a graduated scale, by which the number of barrels or tons of liquid in the tank may be ascertained by observing the height of the surface. These tanks are gradually filled by boat-loads brought from the large towns; and when the season arrives for sowing, in spring and autumn, the farmers come with their carts and tubs, and purchase as much as they may want. The price varies from three to five francs (two shillings and sixpence to four shillings) per hogshead, according to the quality. In a small farm of thirty to forty acres the tank is generally about twenty feet long, twelve wide, and six deep, with a partition in the middle, and arched over, leaving an opening for the pump, and another sufficient to allow a man to go in to empty out the earthy deposit which falls to the bottom. A trap-door shuts over this aperture, to prevent accidents. Sometimes the tank is round like a well, with a domed top, and so deep in the ground, that it has a foot or two of earth over it. The situation of the tank is either in the farm-yard near the entrance of the cow-house, or immediately behind it: sometimes it is like a cellar under the building; but this is apt to cause a disagreeable smell in the cow-house. We here describe those which we consider the most convenient: the form and capacity of the tanks vary greatly according to the means and notions of the proprietors of the farms; but a tank of some kind or other is considered as indispensable an appendage to a farm as a barn or cow-house. The farmer would as soon think of dispensing with his plough as with his tank: and no expense or trouble is spared to keep this well supplied. The numerous towns and villages in Flanders

afford great help in the way of manure. The thrifty housewife and her active substitute the maid know the value of what in our households is thrown away or wasted and lost. A small tank, or a tub sunk in the ground in some corner contains all the liquid which can in any way be useful: soap-suds, washings of dishes, &c., are carefully kept in this reservoir, until, once a week, the farmer or contractor calls with his tub on a cart; and this, mixed with the contents of privies, which are frequently emptied, he keeps in large cisterns for use or sale.*

But this supply is not always adequate to the wants of the farmer, and then he has recourse to rape cakes dissolved in water, or in the tank, which is expensive, and can only be profitable where flax bears a good price, this being the crop for which rape cakes are chiefly used as manure. Every means, therefore, of augmenting the supply of urine is had recourse to, and the most efficacious is the establishment of distilleries. These answer the double purpose of consuming produce, and increasing manure by the number of beasts which are fattened on the refuse wash. It is calculated that every beast produces at the rate of ten or twelve tons of dung, and twenty-six hogsheads of urine in the year. A moderate distillery has fifty or sixty head of cattle constantly stalled. Here then is a supply of manure for several hundred acres of land every year. Formerly there were a great many distilleries in Flanders, but the duty on spirits, and the interference of the government has much reduced their number; so that the farmers complain of the loss of this manure, and the consequent deficiency of their crops.

The dung of pigeons and domestic fowls, where it can be collected in any quantity, is highly valued. The mode of using it is either in a dry and powdered state, to which it is reduced by thrashing with a flail, when it is sown with the seeds of leguminous plants, or else dissolved in the urine tank, and thus spread over the land. This manure is chiefly reserved for kitchen gardens; it promotes the growth of vegetables, and produces no weeds.

The solid dung, from which the liquid has been allowed to run off into the tank, must be carefully attended to, that it may not

* In Ghent we were informed that the sum paid to the servants for the liquids collected, and which is their perquisite, often amounts to as much as they receive for wages; and as consequently the wages are proportionally lower, it is in fact the masters and mistresses who benefit by it.

be too dry, and become *foxy*, as it is called, or burn. It is therefore mixed up with earth and any useless vegetable matter which can be collected into a heap or compost; and when it appears too dry some of the liquid from the tank is poured over it, to excite fermentation, and accelerate decomposition, or it is merely watered, when there is sufficient strength in it to produce heat.

In order to increase as much as possible the quantity of solid manure, there is in most farms a place for the general reception of every kind of vegetable matter which can be collected: this is a shallow excavation, of a square or oblong form, of which the bottom has a gentle slope towards one end. It is generally lined on three sides with a wall of brick, to keep the earth from falling in, and this wall sometimes rises a foot or more above the level of the ground. In this pit are collected parings of grass sods from the sides of roads and ditches, weeds taken out of the fields or canals, and every kind of refuse from the gardens: all this is occasionally moistened with the washings of the stables, or any other rich liquid; a small portion of dung and urine are added, if necessary, and when it has been accumulating for some time, it is taken out; a portion of lime is added, and the whole is well mixed together: thus it forms the beginning of a heap, which rises gradually, and in due time gives a very good supply of rich vegetable mould or compost, well adapted to every purpose to which manure is applied. The place where this accumulation is made is called in French a *croupissoir*, and in Flemish or Dutch *smoor hoop*, which may be translated *smothering heap.*

Besides the manure which is collected on the farm,* the *vidanges* or emptyings of privies obtained from the towns, and the sweeping of streets, a large quantity of peat ashes imported from Holland, are used, principally as a dressing for clover. These are the ashes of the common fuel in use in Holland, and are sold in Flanders by the bushel, as the Newbury ashes are in Berkshire. Mr. Radcliffe has given an analysis of these as follows:

* Since the above was written, the subject of liquid manure has been very ably brought to the notice of agriculturists in a small work by Mr. Cuthbert Johnson, and also by a paper of Mr. Kimberly, in which he announces an important discovery, made by himself, in the management and acceleration of the putrefactive fermentation in vegetable substances. The great activity of manure applied in a liquid state, especially in very light soils, is well known to the Flemish farmers; but they know also that it is rapidly exhausted, and requires to be repeated annually, unless solid dung be used at the same time.

Silicious earth	32
Sulphate of lime	12
Sulphate and muriate of soda	6
Carbonate of lime	40
Oxide of iron	3
Loss	7
	100

The effect of these ashes seems to be very similar to that of the Newbury ashes, and by comparing the analysis of the two we may be led to the ingredients on which the result chiefly depends. Newbury ashes, according to Davy, are composed of

Oxide of iron	48
Gypsum (sulphate of lime)	32
Muriate and sulphate of potash	20
	100

It appears, therefore, probable that the effect depends on the combination of the lime or the alkalis with sulphuric or muriatic acid, and that the silica in the Dutch ashes, and the iron in those from Newbury, have little or no effect on vegetation. This accords with the experiments made with gypsum. The great effect of the ashes in Flanders may arise from the total absence of calcareous earth in the light soils on which they are chiefly used. In the polders they are thought of so little value, that the ashes produced by the burning of weeds are often collected and carried in boats to be sold for manuring the lighter soils of the uplands. But these are not so valuable as the peat ashes.

Wood ashes, after the greater part of the alkali has been extracted for bleaching, are still considered as of great use to the land. Soapers' ashes are in great request for cold heavy soils; and sugar scum from the refiners, if it could be procured in sufficient quantity, would be an excellent manure for every kind of soil Where it can be obtained, they usually throw it into the urine tank; and the mixture is then considered as almost equal to the vidanges, which are looked upon as the *ne plus ultra* of manures. Soot is used as a top-dressing for wheat, or clover in spring, as it is with us. It is thought to destroy insects, and hasten vegtation

The weeds, which grow abundantly in all ponds, canals, and ditches in this level country, where the current is never rapid, are mown in spring, and used in their green state as manure for potatoes. They are laid in the furrows, and the sets placed over them; the furrow is then filled up by the plough, and the weeds, decom-

posing very rapidly, greatly assist the growth of the potato plants: so rapidly do these weeds ferment, that much of their value is dissipated, if they are left only forty-eight hours in heaps, before they are put into the earth.

We have already noticed rape cake dissolved in water as a substitute for urine; it is also used in powder, either as a top-dressing, or sown with the seed. The practice of sowing in drills, and putting in dry manures in contact with the seed by means of drilling machines, has never been adopted in Flanders; nor has the use of ground bones been hitherto introduced to any extent. There is perhaps no modern invention which would be so applicable to the Flemish sands, or so advantageous.*

The manner in which manure is applied to the land for different crops will be explained as these are separately treated of: but the general principle which pervades the whole system of manuring is worthy of attention. Two great objects are always kept in view. The first is to obtain the most abundant crop of whatever is sown, the next is to impregnate the soil with an increasing power of production, if possible, or at least to maintain that which has been obtained. In consequence of this, almost every crop has a certain portion of manure applied to it, which varies according to the nature of the crop to be raised, and that which has preceded; experience having taught that some crops exhaust the soils more than others.

But it is not the mere surface that they desire to manure. They well know that the deeper the soil is fertilized, the greater will be the profit, and the less the labour. They are not satisfied with enriching the land to receive the seed, they furnish food for the growing plant in different stages of its growth, if they think it necessary. There is in consequence no fluctuation in the growth, no check at a time when the plants require support. The seed is made to vegetate rapidly by being in contact with the rich juices of the manure; and hence a much smaller proportion of seed is required. The young blade is invigorated by a judicious watering, and is sooner out of danger of the attacks of insects.

Liquid manure is carried to the fields in common water-carts, which consist of two wheels and shafts, carrying a cask containing

* Since writing the above, we understand that the Belgian Government, having ascertained the great advantage of bones for manure, and also in making animal charcoal for the refining of sugar, has laid a heavy duty on the exportation of them.

from sixty to one hundred and twenty gallons of liquid. The cask has in the under part a hole, two or three inches in diameter, secured inside by a valve: under this is a board a little slanting, to spread the liquid as it flows out of the cask. A man usually rides on the horse which draws the cart, and holds in his hand a string, which passes through a hole in the cask, and opens the valve when required. There is an advantage in riding on the horse, as it does not add to the weight of the load on the wheels, which in light soils would be apt to sink deep. In a momentary exertion it assists the horse by the weight on his back; and the heavy Flanders horses are well able to carry a man, and draw a light load at the same time. When the cask is empty the horse trots home for another load, and no time is lost. It is astonishing what advantage there is in accustoming horses to trot when they have no load; it actually fatigues them less than the continued sleepy walk. Who would suppose that the Flemish and Dutch farmers surpassed us in activity? but whoever has been in the Netherlands in hay-time or harvest must acknowledge it.

The dung which is carried in a solid state is generally used at a time when it is in active fermentation, as it is then supposed to have the best effect. To ensure this in some districts, as the Waes country, where the minutest attention is paid to every circumstance which can increase fertility, the dung is laid on the field in moderate heaps, and on each heap a certain quantity of urine is poured, to excite and renew the fermentation: when it becomes sensibly heated, the dung is spread out and immediately ploughed in. After ploughing in the manure, the land is left for some time, and then a second deep ploughing is given, to incorporate the decomposed dung with the soil, but so as not to bring any to the surface. A short time before sowing, the liquid manure is poured over, and this enriches the surface to make the seed germinate sooner.

Lime is not much used in the light soils, but commonly in the the cold and stiff. As it is generally brought from a distance, it is dear, and this prevents any extensive application of it. Marl is found in a few spots, and serves to improve the poorer lands within reach of it.

CHAPTER V.

SUCCESSION AND ROTATION OF CROPS ON DIFFERENT SOILS.

EXPERIENCE has long convinced the Flemish farmer, that there is an advantage in frequently changing the crops on the same land: and in the choice of these he finds that there is a difference in the return, according as certain crops follow one another. In the course of time fixed rules have been laid down, from which a prudent farmer seldom deviates. The approved rotations, in general, accord with sound theory; and where they do not, we must pause before we condemn, and take all circumstances into consideration. We must consider, first of all, what produce is most wanted, or for which there is the greatest demand, as that will always be the most profitable in the market: next the quality of the soil with respect to that produce, compared with others; and lastly, by what means a given soil may produce this in the greatest perfection, and at the least expense. As far as the different crops are concerned, it is a mere matter of calculation, which it is most profitable to sow. But this may be greatly modified by the effect of the crops on the subsequent produce, or by the wants of the cattle, which must be kept for the sake of their dung. Hence in one situation a rotation may be the most advantageous, which in another is not so. Where an unlimited quantity of manure can be procured, it may not be necessary to raise so much food for cattle. Where wheat is in great demand, it may not be worth while to sow rye, if wheat will grow as readily with a little more manuring. Where rye is the chief food of the population, and the soil produces it more readily than wheat, as is the case in all sandy soils, rye is the principal crop. Where barley is in demand, and the soil consists of a thin coat of earth over a solid chalk, as is the case in some parts of England, barley naturally becomes the chief crop; and so likewise in the polders, where extraordinary crops of barley are grown, this grain is the most profitable. Green crops and roots, excepting potatoes, which are become a principal food of man, must be considered as subsidiary crops, raised only to increase manure by means of cattle, or to re-invigorate the land exhausted by corn crops. If Tull's system could have been established, and wheat could have been made to grow on the same land, year after year in succession for ever, no advantage would have been obtained, because it would soon have been as

common as oats; but rotations would have been useless. But setting aside theories, it has been clearly proved by experience, that variety of produce is essential to continued fertility. Even where no rotation is apparent, one really exists. The natural grasses are so numerous that we do not perceive how they vary and succeed each other; but whoever has attentively examined a rich meadow, in which the grass is allowed to stand till the seeds are ripe, will find that every year there is some change: the grasses which were most abundant disappear, and others take their place; in time the first appear again, and the rotation is established, which any one may be convinced of by examining the hay made off the same land in different years. The fairy rings produced by a species of mushroom prove to demonstration, that the ground may be tired of particular plants, and refuse to bear them; but the richness of the grass in the ring proves also that the soil is not exhausted.

In the usual rotations adopted in Flanders, it will be found that all these circumstances have been taken into consideration; and as by a wise disposition of Providence, the bees, without reflection, are compelled by circumstances to build their cells strictly hexagonal, the very best form which a mathematician could devise for their purpose, so, by circumstances, men may be led to adopt the system of cultivation which is most advantageous on the whole, without any knowledge of the principles on which it is proved to be so.

To begin with the light sands. On the poorest spots, which are only just reclaimed from a state of barenness, the principal object is to increase the active vegetable soil or humus; and the rotation must exclude those crops which greatly exhaust it. Wheat is out of the question, and potatoes can only be raised to be consumed on the spot. There must be something for the cultivator to live on, and this may be rye and milk. The first is raised by the help of manure, the second is obtained by growing clover and roots for the cows: these then are the basis of the rotation. Buck-wheat will have a place, as it grows readily on poor light soils; carrots and turnips are indispensable for the cattle, and with a little help of manure, will grow well also. Here then are the materials for a rotation, which it only remains to arrange in the best manner. Mr. Van Aelbroek has given a very comprehensive table of the rotations and variations adapted to poor sandy soils; we will insert it here (see next page) as being

a good authority; premising that, although it contains all the usual variations, it does not follow that every farmer adopts the whole rotation with all its varieties.

TABLE OF ROTATIONS IN A POOR SANDY SOIL.

First Year.	Second.	Third.	Fourth.	Fifth.	Sixth.	Seventh.	Eighth.	Ninth.	Tenth.
Flax and Carrots.	Rye and Turnips	Rye and Turnips	Buck-wheat.	Carrots.	Potatoes	Barley and Turnips	Flax and Carrots.	Flax and Carrots.	Rye and Turnips
			Oats.	Clover.	Barley and Turnips	Potatoes	Rye and Turnips		
			Potatoes Peas and Carrots.	Oats, Rye.	Clover.	Rye or Barley & Turnips	Ditto. Oats and Potatoes		
			Spurrey and Turnips	Buck-wheat.	Potatoes	Oats.	Flax and Carrots.		
Flax.	Rye.	Clover.	Rye and Turnips	Rye and Turnips	Oats or Buck-wheat.	Potatoes	Rye and Turnips	Flax.	Clover.
Flax and Clover.	Clover.	Oats or Spurrey or Peas.	Rye and Turnips	Rye and Turnips	Buck-wheat or Potatoes or Carrots.	Carrots.	Rye and Turnips	Rye and Turnips	Flax.
						Barley and Turnips	Oats.		
						Rye and Turnips	Rye and Turnips	Flax.	

We have to remark on this table of rotations, that rye, with turnips sown after the rye is reaped, are repeated two years in succession. This appears against all rule, but the turnips come in between, and seem to recruit the land for a second crop of rye: and it must be remembered that every one of the crops, excepting buckwheat, has more or less manure. Flax has commonly clover or carrots sown with it: turnips are mostly a second crop after rye or winter barley, a small proportion only being sown early. This rotation admits of considerable variety, and does not end correctly as it began; but the flax returns in the eighth, ninth or tenth year. Care is taken that there be no confusion; and where a crop is anticipated in the first course, allowance is made for it in the next. This table includes several different rotations, which may be followed singly; but the Flemings like to have a great variety of produce every year, so that the different rotations go

on simultaneously. If the succession of crops is noticed in any particular field, it will be found that a very regular course has been pursued with regard to it.

In a soil of a better quality, which is a good light loam naturally adapted to bear wheat, or made so by assiduous cultivation, it is not uncommon to divide a farm into eleven equal portions, which are cropped as follows:—

$\frac{2}{11}$ In potatoes.
$\frac{2}{11}$ In wheat and turnips.
$\frac{2}{11}$ In oats and clover.
$\frac{2}{11}$ In clover.
$\frac{2}{11}$ In rye and turnips.
$\frac{1}{11}$ In grass left as long as it is good.

The rotation is kept regularly in the order here stated.

When flax is grown, the order is as follows:—wheat, rye and turnips, oats, flax, clover, rape, potatoes.

In this kind of land buckwheat is only sown when manure is deficient, every other crop having some dressing or other. Mr. Van Aelbroek gives a more complicated table for the richest kinds of light soil. It is as follows:—

TABLE OF ROTATIONS FOR THE RICHEST KIND OF LIGHT SOIL.

First Year.	Second.	Third.	Fourth.	Fifth.	Sixth.	Seventh.	Eighth.	Ninth.	Tenth.
Flax and *Clover,	Wheat.	Rye and Turnips	Rye or Barley, and Turnips	Potatoes	Wheat.	Rye and Turnips	Flax.	Clover.	
			Potatoes	Wheat.	Rye or Barley, and Turnips	Oats.	Flax and Carrots.	Rye.	Clover.
or Carrots.	Oats.	Rye and Carrots, or Barley and Turnips	Potatoes	Wheat.	Rye and Turnips	Barley and Turnips or Oats.	Flax.	Clover.	
	Barley and Turnips	Rye and Carrots.	Potatoes	Wheat.	Rye and Turnips	Flax and Carrots.	Oats.	Clover.	

* If clover is sown with the flax it is cut in the second year, and another year is added to the rotation: but it is more usual to sow carrots with the flax, and sow oats or barley the second year.

In this rotation two and even three crops of corn follow each other, which can only be excused by the intervention of turnips, and the repeated manuring. In a farm of any extent a greater proportion of grass or clover must be sown to supply the manure required for the other crops: the potatoes are all consumed on the farm; wheat, rye, and flax are the only produce sold.

When we come to the cultivation of the different crops separately, we shall see what a quantity of manure is required in the Flemish system, a great part of which must be purchased, notwithstanding the quantity of stock which may be kept on the clover, turnips, carrots, and potatoes grown.

When the soil is sufficiently strong to grow beans this useful crop is introduced as follows:—

1 2 3 4 5 6 7 8 9
Potatoes, wheat, beans, rye, wheat, clover, turnips, flax, wheat,
10 11 12 13 14
oats, fallow, tobacco, rye, oats.

This is a very long rotation in which a fallow is introduced in the eleventh year. Tobacco requires a good friable soil, so that this must be a very superior loam. In a stiff loam near Alost the following rotation is adopted:—

1 Potatoes, with 20 tons of dung per acre.
2 Wheat, with 3½ tons, and 50 barrels of urine.
3 Flax, with 12 tons dung, 50 barrels urine, and 5 cwt. rape cake.
4 Clover, with 20 bushels wood ashes.
5 Rye, with 8 tons dung, 50 barrels urine.
6 Oats, with 50 barrels.
7 Buckwheat, no manure.

The quantity of manure used here appears extraordinary, and although the soil is called a stiff loam, it is by no means so in reality, for, from constant cultivation and manuring, it is more like a fine mellow brown garden soil. It seems rather too rich for buckwheat, but the oats will have reduced it, as the liquid manure only acts on the immediate crop, and leaves little behind.

In a rich loam at Vlamertingen, two miles west of Ypres, the following rotation is found:—

1 Turnips, carrots, chicory.
2 Oats and clover seed.
3 Clover.
4 Wheat.
5 Flax.
6 Wheat.
7 Beans.
8 Wheat,
9 Potatoes.
10 Wheat.
11 Oats.

This is the most scourging rotation of any, and proves a very rich soil; the manure, however, is not spared. Great attention to weeding can alone supply an occasional summer fallow. The potato crop and the flax help to keep the land clean. In the 1st, 3rd, 4th, 7th, and 9th years the land is manured.

On the rich heavy loams, the following is the Table of Rotations given by Mr. Van Aelbrock:—

TABLE OF ROTATIONS FOR A GOOD CLAY OR STRONG LOAM.

First Year.	Second.	Third.	Fourth.	Fifth.	Sixth.	Seventh	Eighth.	Ninth.	Tenth.
Flax.	Clover.	Oats.	Carrots or Barley and Turnips	Wheat.	Rye and Turnips	Potatoes	Wheat.	Rye and Turnips.	Flax.
				Beans.	Wheat.	Rye and Turnips	Potatoes	Rape and Carrots.	Flax.
		Barley and Turnips	Rape and Carrots or Beans	Wheat.	Rye and Turnips	Potatoes	Rye and Turnips, Wheat.	Oats or Flax. Rye or Barley and Turnips	Flax.
	Wheat.	Barley	Beans.	Wheat.	Rye and Turnips	Potatoes	Rape and Turnips	Oats or Flax.	
		or Rye, and Turnips	Oats and Clover or Potatoes	Clover, Rape, and Turnips	Wheat.	Rye and Turnips	Flax.		
	Rape and Turnips	Wheat.	Rye and Turnips	Oats.	Clover.	Wheat.	Rye or Barley and Turnips	Oats or Flax.	

Here is a great variety of produce, some of which, as rye, is more suited to a light soil; but the demand for rye, both for the distillers and for bread, determines the cultivation of it whenever it can be done. Wheat and rye occur twice in the course, potatoes and flax only once. Turnips as often as they can be grown after a crop of corn. Only a small proportion of beans are sown. This is owing to the smaller demand for this pulse, and also to the manner in which beans are usually sown, viz., broad-cast, which

does not insure a good crop, although the closeness of the stems smothers the weeds.

From these specimens of rotations a tolerable idea may be formed of the general system. The mode in which each crop is cultivated will form the subject of the next chapter.

CHAPTER VI.

OF THE CULTIVATION OF RYE, WHEAT, BARLEY, OATS, AND BUCKWHEAT.

The general preparation of the soil for these different crops varies according to the season in which they are sown, and the crop which preceded. All, except buckwheat, are well manured at the time of sowing, and sometimes also during their progress towards maturity. The principle which pervades the whole system is to force the first vegetation, by which means a much smaller quantity of seed is required, and to supply the food necessary for the growth of the plant. The manner in which rye and wheat are put in will give an example applicable to every other grain.

Rye is everywhere a principal crop, as it forms a considerable portion of the food of the working classes in Flanders, seldom made into bread by itself, but mostly mixed with a portion of wheat, and sometimes with barley also. Rye is sown in light soils, as often as it can be done with any prospect of advantage, and, as it is found that a crop of turnips sown after rye harvest much repairs the soil, a second crop of rye is generally taken, as may be observed on inspecting the tables of rotations. But it must be remembered that this second crop is well manured, and that with deep ploughing and ample manuring, land will produce a good crop of the same kind of corn much more frequently than it would under less favourable circumstances.

When wheat or rye are sown after a white straw crop, as we call it, that is, after wheat, rye, barley, or oats—which can only be done with advantage under very favourable circumstances—the stubble is well harrowed soon after harvest, in order to pull up the weeds, and expose their roots to the sun. In the beginning of October from ten to fifteen tons per acre of good rotten dung are spread evenly over the land, and immediately ploughed in six inches deep: the land is ploughed in stitches or beds, varying

from six to twelve feet wide, according to the nature of the soil; the heavier soils are laid in the smallest stitches: liquid manure at the rate of ten hogsheads per acre is then poured into the intervals between the stitches, by means of a water-cart, which delivers it regularly, the horse walking in the interval. The harrows are now drawn across the stitches. This brings a part of the fine soil into the intervals, and prevents the too rapid evaporation of the liquid manure. Six pecks of rye, or of wheat, or two bushels of winter barley, are now sown evenly over the land. The manured soil in the intervals is first stirred by the plough going once up and down, as is done between rows of turnips in the Northumberland system, throwing the loose earth in a ridge in the middle. Men follow with shovels, and throw this earth over the seed, as is done with potatoes in lazy-beds in Ireland, and completely cover it. A roller is then passed over, if required; or in very loose soils, men tread in the seed regularly with their feet, as the gardeners do. The small extent of the farms allows of this garden culture, which in large occupations would be impracticable; but the principle is the same, whether executed by manual labour or machinery. A stiff heavy soil is ploughed nine inches deep, immediately after harvest, and laid in narrow stitches; spits of earth are dug out of the furrows with the spade, and placed regularly over the ploughed part, without breaking them, as was described before, and they are left in this state for several weeks, till seed time, when lime is spread over the land at the rate of fifteen or twenty bushels per acre: the harrows level the lumps, and mix the soil with the lime: five or six hogsheads of liquid manure are poured over this, and very little more than a bushel of rye or wheat per acre is sown; the earth from the intervals is then shovelled out, and spread evenly over the seed.

When wheat or winter barley succeeds potatoes, as is generally the case, the ground is not ploughed, but only harrowed across: the stitches are marked out by the plough, and the earth in the intervals is spread over the seed. About a bushel and a-half is the greatest quantity of seed sown per acre. The average is five pecks. After rape, which is reaped early, there is time for a bastard fallow, which is not lost sight of. The land is ploughed, cross-ploughed, and laid in stitches, and then the wheat is sown in the same manner as before described. It must, however, be observed, that as potatoes and rape are very highly manured, no additional manure is put on for the wheat, but should its

appearance in spring not be vigorous, the urine tank is resorted to, to supply the deficiency.

Great attention is paid to the choice of seed; the wheat is generally pickled or steeped in salt water, and dried by sifting lime over it before it is sown. Some scientific farmers use vitriol, arsenic and various preparations, to prevent smut; but urine, salt, and lime are the most common, and seem to answer the purpose completely. The other grains are not usually prepared by steeping, but sown in their natural state.

There are several varieties of rye, but none appears to possess any decided superiority: of wheat there are many sorts, white and red. The white wheat which grows at Kalken, not far from Ghent, is in great repute for the fineness of its flour. It seems to degenerate in every other soil. We have seen a red wheat with a white chaff in one or two places, which bears a very great resemblance to some of the wheats lately brought into notice in England under various names. The common sorts both white and red appear full, and the straw strong and healthy: careful cultivation no doubt increases the produce, and lessens the casualties from disease or climate. A mixture of wheat and rye is sometimes sown, which is called *meslin* in Yorkshire, and *meteil* in Flanders. It is asserted that, in a certain proportion, the two grains produce more when sown together than they do if each be sown separately. Those who defend the practice maintain, that if the season does not suit wheat it suits rye, and that between the one and the other a crop is secured. The adversaries assert that rye and wheat ripen at different times, and that the wheat will be reaped too green, or the rye will be over-ripe, and shed. But as pure wheaten-bread comes more and more generally into use, meslin is in less demand, and can only be used in the farmer's family. Wheat and rye separately are more readily disposed of in the market, and this will be sufficient to decide the question; accordingly meslin is but sparingly sown: where the land will bear it, wheat is sown instead; where it suits rye better, the latter is preferred.

Barley is considered as a grain of much importance in a country where the vine does not thrive, and where beer is the principal beverage. The variety preferred is that which is sown, like wheat, in autumn, and is called winter barley. In the rich soils of the polders, especially those which contain much silicious and calcareous sand in their composition, extraordinary crops of barley are

sometimes raised, as much as ten quarters per acre, weighing from 50 to 56 lbs. per bushel, and this induces the farmers frequently to sow this grain twice in succession, without any manure. The favourite sorts are called *Escourgeon* and *Sucrion*. They are sown in autumn, and reaped in July. Spring barley is sown occasionally, but produces a smaller return, and the grain is lighter. Some Chevalier barley was sent over a few years ago from England, which was heavier than any spring barley grown in Flanders: its weight was 57 lbs. per bushel. Whether it has increased and been extensively sown there we have not had any means of ascertaining. New productions or new methods are not readily adopted by any farmers, and least of all by the Flemings. The advantage of spring sown barley is, that it gives time for feeding off turnips, and getting the land in good order for sowing. When the Flemish farmer shall have found out the advantage of folding sheep on turnips in winter, or as soon as the snow is gone, barley will be more generally sown in spring. There is in fact no specific difference between winter barley and spring barley, and they are readily transformed into each other. Some varieties are hardier, and stand the frost better; but they will all ripen in good time, if sown in spring. The Siberian six-rowed barley is very hardy, and consequently is preferred in England for autumn sowing, but its use is chiefly as early spring fodder for sheep, and it is seldom sown for a main crop; the small portion which is allowed to stand for seed is merely to have a supply to sow again, or to be sold for that purpose. The Scotch bere is a hardy inferior sort, fit for exposed situations. The Sucrion is a flat barley with two rows of seeds, which stands the winter well. All barley requires a soil in which the roots can spread readily: the best preparation for it, therefore, in heavy soils, is potatoes, as they are usually highly manured, and the earth is well stirred by repeated ploughings. When it is taken after wheat, it is most advantageous to sow it in spring, having given a good tilth to the land before winter, and another in spring. In this case a good manuring both solid and liquid is applied. In light soils carrots are sown among the barley, in spring, thus making the earth produce two crops at the same time, the first reaped in July, the second drawn in October.

Oats are frequently sown after clover, and sometimes after rye or potatoes, as suits the rotation. It is a grain that thrives in almost any soil, with a small proportion of manure, and when the land is enriched gives a large return. The preparation for oats,

in Flanders, begins by spreading dung over the clover ley, but in a smaller quantity than for barley. This is ploughed in before winter, with a shallow furrow, which is laid over flat, to accelerate the decomposition of the roots of the clover. Sheep dung is thought peculiarly good for this purpose. The land is ploughed deep in spring, not to bring the dung again to the surface, but to turn a coat of earth over it. Liquid manure is sometimes spread over the surface before the seed is sown, but not always. The crop seldom fails to give from six to nine quarters per acre from two bushels sown, which is not more than half the seed usually sown in England. When grass-lands are broken up, oats are the most productive crop without any manure, and two crops of this grain are frequently taken in succession, which, as we observed before, can seldom be profitable in the end, whatever be the immediate gain; but the temptation of two good crops, with little or no expense, is too strong to be resisted. Oats are sometimes reaped with the Hainhault scythe, and sometimes mown. From the length of the straw, which is the consequence of high manuring, it is thought most advantageous to tie it up in sheaves at harvest, to prevent the shedding of the seed, if it be taken up loose.

Buckwheat is a grain which comes in very conveniently to be sown in poor, light soils, when the manure runs short. If the soil is rich it runs to stalk, and produces a succession of flowers, and but little seed is brought to perfection: as it is a plant which will not bear the least frost, it has but a short period to grow and ripen its seed in; and if the growth is luxuriant, the vegetation of the stem is prolonged till the frost nips it. It is sown late in the season, and may be considered as a subsitute for a fallow. The land is generally ploughed three or four times, and well cleaned, and the buckwheat is sown in the middle of May. It usually precedes potatoes or carrots, for which the repeated ploughings prepare the soil; and the buckwheat, by the shade of its broad leaves, smothers all the annual weeds. It is sometimes ploughed into the land in a green state, when manure is scarce, and then it is succeeded by rye or wheat; but this is not a common practice in Flanders, where manure can generally be obtained in abundance by the canals. Buckwheat is used for feeding poultry and pigs, and also for distilling. When it is ground, it produces a very white flour, from which a pleasant cake, like a crumpet or thick pancake, is made, which is much relished by the peasants.

CHAPTER VII.

OF THE CULTIVATION OF LEGUMINOUS PLANTS, PEAS, BEANS, TARES, AND GREEN CROPS, CLOVER, SPURRY.

Peas are cultivated on the light soils, but, as is the case with buckwheat, they are only sown when the land is not thought sufficiently rich for other crops, and when there is a deficiency of manure, as little or none is given to the land for this pulse. They are generally sown broad-cast, in the month of April, and the seed ploughed in: two bushels of seed per acre is the usual quantity. The ground is prepared by being ploughed once or twice in autumn, and again in spring, but less care is bestowed on this crop than on any other. When the plants are about four inches high they are well hand-weeded. The produce is from twenty-eight to thirty-two bushels per acre. Neither peas nor flax are sown again on the land which has borne a crop of peas, in less than eight or ten years. The white pea, which is split for ship store, is preferred as the most valuable, but the grey pea for hogs is also common.

The cultivation of beans on the heavy soils, which alone are fitted for this pulse, is by no means so perfect as in England, especially in Kent. The broad-cast method of sowing prevents the use of the horse-hoe; and as a principal object in sowing beans in Flanders is to smother the weeds, they are sown so thick that the hand-hoe is of little use. The manner in which the land is prepared is as follows: having been ploughed in autumn, and well harrowed to destroy the weeds, it is ploughed again very deep in March, and the stitches are reversed, the crown being where the interval was before. It is again well harrowed, and about three bushels of beans per acre are sown regularly by hand, and harrowed in; after this ten or twelve tons of manure are put on evenly, or, if the soil is very heavy and cold, eight tons of manure and fifty bushels of lime. This is ploughed in with a very shallow furrow, only two or three inches deep, and then the land is laid smooth by passing the harrows reversed over it. Some farmers sow the beans after the manure is spread, and plough in both together; others plough in the manure first, and then sow the beans, and cover them with the harrows. This last method does not sufficiently cover them, and if the weather should be dry soon after sowing, the beans will not come up so regularly.

A few intelligent proprietors have seen the deficiency of this method both in the crop and in the state of the land after it, and have adopted another practice taken from the gardeners. A man, with a strong hoe like the Devonshire hack, makes holes in a line, at a foot or more from each other, and women follow and drop two or three beans in each hole, which are covered with the earth scooped out of the next row of holes as the workman returns. The distance between the rows is the same as between the holes in the rows; and by making the holes in one row opposite the intervals of the other, the whole field is planted in a quincunx order, as is usually done with cabbage plants. There is a great saving of seed in this way of planting beans; and when the plants come up they are well hoed and weeded, and the earth is drawn up all around the stems. The produce is much greater, and the land is as clean as after a fallow. Another method, where the land is sound and dry, is to spread the manure, and rake it into the furrows as fast as they are made by the plough; beans are then dropped on the manure, and covered with the earth of the next furrow when the plough returns, till the whole field is planted. If this is done in every second furrow only, the crop will be all the better, and the land more easily hoed. Horse-hoes have not yet been introduced into practice; some such instruments have been brought from England, but they are mere objects of curiosity, and are despised by the ignorant. In heavy soils some of the best farmers trench-plough the land, by means of two ploughs following each other in the same furrow. This is most advantageously done before winter, that the frost may mellow the poorer earth brought up. A good liming and manuring soon bring the whole mass into a fertile state, and in this deep soil beans grow luxuriantly. In some districts where the soil is loamy, they sow peas and beans together, and sometimes tares also: the object is to produce green food for the cows and pigs in summer. In this case the closer the plants can be made to grow the better for the land, as nothing cleans it more effectually. The crop is cut at the time when the pods are just formed, and while the top is still in bloom: it is used in a fresh green state, as tares are in England. If any extent of ground is devoted to this crop, portions are sown at different times, to have a regular succession: it produces the heaviest crop of green food that can well be got from the land. This practice is worthy of imitation in our stiff soils. It seems not to exhaust the land, and leaves an admirable surface to sow

wheat in with a single slight ploughing; or, if it be thought advantageous, there is ample time thoroughly to pulverize the soil during summer and autumn.

Tares are occasionally sown for their seed like peas, but they do not enter into the usual rotations, and as the generality of soils are light, clover is preferred. In the heavy soils they are mixed with peas and beans for green fodder as we noticed above. A more extensive cultivation and succession of winter tares and spring tares might afford a useful addition to the food for horses in summer, especially as clover cannot be sown with advantage on the same land oftener than every seven or eight years.

Clover is the glory of Flemish farming, and in no country is it found in greater perfection. It was from Flanders that the cultivation of this productive and useful plant was introduced into Great Britain. Sir Richard Weston, in an account of a journey into the Netherlands, in 1645, speaks with admiration of the fields of clover he had seen there, when clover was not known in England as a cultivated crop, and only found amongst natural grasses in rich meadows. The large broad clover, commonly called red clover (*Trifolium Pratense*,) is that which is chiefly cultivated in Flanders. This is sown in spring, at the rate of 8 lbs. of seed per acre, amongst the barley, oats or flax, or in the rye or wheat which were sown in autumn. When it is sown among flax, which is drawn without injuring the clover, it is cut the same year. With barley it is apt to become too rank, and impede the drying of that crop at harvest. In the second year the clover comes to perfection; it is then mown at least twice, but often three times in the season, furnishing a heavy green crop each time. The great use of clover for cattle tempts farmers to repeat the crop too often on the same ground, and the consequence is a failure, not only on account of the soil being deteriorated for this plant by the too frequent production of it, but also by encouraging a most destructive parasitical plant called the *Orobanche*, which in some places in Flanders threatened to put an end to the cultivation of clover. The minute seeds of this plant fix themselves to the roots of the clover, and vegetate at their expense. The plant affected becomes weak, and ultimately dies away, and the Orobanche spreads so rapidly that whole fields of clover are soon destroyed, if the progress of it be not arrested in time: the only sure remedy is to keep the land in good tillage, and not to sow clover in it again for at least eight or ten years; if it be sown sooner the Orobanche

will again make its appearance. This plant is known in England, but its devastations have never been so great as to lead to any public notice of it. It is easily discovered, rising several inches out of the ground, and the stem being of a peculiar scaly form.

In the spring of the next year after the clover is sown, it is almost universally dressed with Dutch peat-ashes, at least in the lighter soils. From thirty to fifty bushels are spread on an acre, about the end of February: showery weather is favorable to their being washed to the roots of the clover. In strong soils the top-dressing often consists of the compost, which we have described as being collected in the croupissoir, which is rich and well mixed with lime. When weeds appear among the young clover they are carefully pulled up at the time when the top-dressing is put on; and if the plants seem weak and thin, a sprinkling of diluted tank liquor invigorates the growth.

The greatest part of the clover is given to cattle in a green state, it being then most nutritive: hay is only made of any surplus quantity which could not be consumed in the season. This is usually made about the middle or end of June. In the making of clover hay there is nothing superior to the methods used in England, excepting that small proprietors sometimes reap it and tie it in bundles, as is done with corn, especially if the seed be ripe: by this means the leaves are less scattered about, and in them is contained the principal nourishment of the plant. In order to have clover seed free from admixture with the seeds of weeds, women and children are sometimes employed to gather the heads of the clover, singly, when ripe: they collect them in baskets, and carry them to the barn till they can be thrashed, which is usually done in dry frosty weather, because then the capsules are brittle, and the seed separates more easily from them.

The Waes country is that which chiefly supplies the market with clover seed; and Lokeren is the place where the greatest quantity is sold. Many farmers from other districts prefer buying this seed to saving their own.

The value of an acre of clover is very considerable. The first crop is often sold on the ground for 120 francs, nearly 5*l.* per acre, and the seed from the second crop, which in the Waes country frequently amounts to five or six cwt., may be worth there as much more, making the whole produce amount to 10*l.*, with very little outlay. Taking the difference in the value of agricultural produce, this is fully equal to 15*l.* per acre in England, a sum

which few crops of clover will realize here, when the expense of making the hay is deducted. When the clover-plant fails the land is ploughed in autumn, and some other crop is sown; or fresh clover seed is sown in the vacant places, in the following spring, and the bush-harrow or the traineau is drawn over, to bury it: by this means a good crop is often secured by the end of July.

Spurry—*Spergula Arvensis*—is a plant which grows very rapidly in light sandy soils. It is often sown immediately after barley harvest, to be cut in time for the sowing of rye. The produce is trifling, but it costs little, and cows are very fond of it. It is said to give their milk and butter a very agreeable flavour. Ten or twelve pounds of seed are sufficient for an acre. A variety much larger and more productive than that which is a mere weed in our light soils is sometimes sown in the end of March, and, with the help of liquid manure, produces a tolerable crop in less than two months; after which a crop of potatoes may still be had, or, at least, a very good crop of turnips. This is sometimes a convenient way of bringing a field into a regular course again, when, from some circumstance or other, the usual rotation has been disturbed.

Lucern, which is so highly prized in some countries, is not cultivated to any great extent in Flanders. The poor light sands are not very favourable to this plant, which likes a rich deep soil. In western Flanders there are some soils well adapted to its growth, but it is not so common as to form any marked feature in Flemish husbandry. Barley is sometimes sown to be mown green in spring, but rye, which is chiefly sown for that purpose in England, is seldom cut green. This arises probably from a reluctance to cut down a plant which, when it comes to perfection, produces the principal food of the people. That this is no sufficient reason the slightest reflection will convince us, for rye cut in a green state does not exhaust or deteriorate the soil, as it would when left to ripen its seed, and it may therefore be sown again on the same land without waiting the usual time allowed for its recurrence. The question is simply as to the value of the seed sown when compared with that of the green crop.

Buckwheat is sometimes cut for fodder in the light sands, and helps to make up for a deficiency of clover.

CHAPTER VIII.

OF THE CULTIVATION OF ROOTS, POTATOES, TURNIPS, BEETS, CARROTS PARSNIPS, CHICORY.

If we are indebted to the Flemish for the introduction of clover and turnips into our agriculture, they are equally so to us for the valuable potato. This root is now become a great substitute for corn throughout all Europe, and its influence on the population cannot be denied. When corn fails potatoes are generally most abundant, and thus prevent that distress which is so great a check to population. In Flanders potatoes form a part of every rotation, the light soils being peculiarly adapted to the growth of this root; and as a great part of the produce is consumed by cattle, and thus gives an adequate return in manure, the objection often made to its extensive cultivation, that it exhausts the soil and returns little to it, is not well founded. Were it not for potatoes to keep the cattle during the latter part of the winter and beginning of spring, when the supply of turnips fails, a much smaller number could be kept, for hay is a dear fodder in most parts of Flanders.

Potatoes were at first only known as an esculent root in gardens, and it was a long time before their real value was found out. In 1740 they were for the first time sold in the market of Bruges, in consequence of the zeal of an individual of that town, Mr. Verhulst, who distributed some sets gratuitously to the farmers in the neighbourhood. From that time the cultivation increased rapidly, and spread all over the country. The varieties which are mostly sold in the towns are the earliest and best flavoured, which are chiefly raised in sheltered gardens. The plant being a native of a warmer climate cannot bear the least frost. It is therefore not safe to plant it in the fields before March or April. The sets which are planted to produce an increase are not seeds but buds, and as such perpetuate the qualities, good or bad, of the parent stock. Each variety proceeds from some original plant raised from seed, and is subject to age and decay with its parent. Hence varieties continually degenerate or wear out, and fresh or new varieties must be produced by sowing the seeds: recent experiments and observations fully bear out the truth of this assertion. It is therefore not sufficient merely to find a superior variety, the age of the parent plant should also be noted. Some will last longer than others, but all old varieties sooner or later show marks

of decay; and the sooner they are exchanged for younger and more vigorous the better. In Flanders the principal crop of potatoes is planted in April. Potatoes require much manure to give a great return, although those which grow in poor soils are much pleasanter to the taste. For cattle, however, quantity is of more consequence than flavour. The soil in which potatoes are to be planted should be well prepared by deep and repeated ploughing, or what is still better, by trenching with the spade. In Flanders the sets are planted in rows two feet wide or more, and the same distance between the sets, so that each plant may have the earth drawn up to the stem, and a small hillock made round it. Sometimes the land is ploughed and manured as for other crops, excepting that the quantity of manure is at least double the quantity usually put on for corn. The sets are then dropped into holes regularly made with a blunt dibble, and filled up with earth. These sets are either small potatoes picked out for that purpose, or larger cut into pieces, taking care that there shall be at least two eyes or buds left in each piece. When potatoes are planted to any considerable extent, the method is similar to that which we described for beans, the furrows being proportionably deeper; the sets are dropped upon the dung in every second or third furrow about eighteen inches apart, and covered by the return of the plough. In this manner nine or ten bushels of potatoes will plant an acre. The crop averages about three hundred bushels, if the land is well prepared, and the potato-plants have been well hoed and moulded up. This is not very great return, considering the quantity of manure. The quality of the potatoes depends on the nature of the soil as well as on the variety planted: in light sands the potatoes are small, and mealy when boiled; in good loams they grow large and more juicy, but are not so well flavoured: the latter producing a greater bulk are preferred for cattle.

There is a potato called *Schelde Windeke* potato, from the name of a village near Alost: they grow in a strong soil, and are remarkably mealy and good; but they rapidly degenerate when planted in a different soil. The potatoes which are preferred for cattle are called *Elsen Motten* and *Katten-bollen*, both very large. A variety was introduced from England into the neighbood of Ghent some years ago, by a gentleman of the name of Lankman, which are in great repute, and go by his name. It would be difficult to point out the variety from which these sprung, as the soil in which they are transplanted has, no doubt had a great influence on their

present quality. A few small Flemish potatoes, which we once sent to a friend at Kenilworth, produced in that rich soil some of the largest potatoes we ever met with. None of the original potatoes were so large as a hen's egg.

When we were on the subject of manures we mentioned the pond weeds as highly useful in planting potatoes. Long litter and even old thatch is excellent to plant the sets in, if the soil is not very light. Potatoes are usually taken up in the end of September: this is done by means of a three-pronged fork, which is less apt to cut the roots than the spade. The ground is at the same time cleared of the roots of couch grass, and other perennial weeds; and when the harrows have gone over the field, and all the potatoes are picked up which had escaped the fork, no other preparation is required to sow wheat or winter barley. When the seed is sown the stitches are marked out by the plough, the intervals dug out, and the earth is spread over the seed, after the urine cart has deposited half the usual quantity of liquid manure in these intervals. This is sufficient on land which has had a double manuring for the potatoes.

Turnips are not often cultivated as a main crop, or a substitute for the old fallows, as it is in England and Scotland, but mostly as a second crop after barley or rye, which we call *eddish turnips* in England. But as the barley and rye harvest are early in Flanders, and not an hour is lost in getting the turnip-seed sown, they are often of a very good size before winter.* The crop, however, can bear no comparison, in point of weight, with a turnip crop in Norfolk, still less in Berwickshire and Northumberland; but it is obtained at a small expense, and does not interfere with any other crop. In a farm of twenty acres, if five acres were set apart every year for turnips, the remainder would scarcely give sufficient occupation to the farmer and his family, and produce sufficient corn to feed them and to pay the rent. It is by the quick succession of

* Mr. Van Aelbroek sowed some turnips in May, 1837, and they were of sufficient size in August to be given to the cows. Large turnips are not thought so sweet as the smaller, which do not give that disagreeable taste to the milk, which prevents many farmers in England from giving them to the milch cows.—The introduction of early turnips in Flanders might be of great advantage. If winter tares were sown to be cut in May, and turnips to follow immediately, these two crops, with the intermediate ploughing, would prepare the land admirably for wheat or colza, and not only give two useful crops, but have all the meliorating and cleansing effect of a fallow.

crops that a small farm is made to produce much more in proportion than a large one, and that every member of a family is constantly and busily employed. As soon as the corn is cut, the portion of the field which is cleared is ploughed and harrowed, liquid manure is poured over it, and the seed is sown; so that in twenty-four hours an acre which was but just cleared is again producing a fresh crop. The ploughing and sowing goes on every day, and follows on the heels of the reapers: of such consequence may be the delay of two or three days, that the seed sown first will be out and in the rough leaf, when that which was two or three days later is only just coming up, and is subject to all the depredations of insects. When the turnips are fairly up, they are watered with diluted urine, and their growth is rapid beyond belief. We have seen turnips sown in the middle of July, after barley harvest, which in the end of August already showed very promising bulbs. If it were not for this accelleration of the growth, no crop of any weight could be raised by the end of September, when they are usually pulled up.

The cultivation of the beet-root had been introduced into Flanders under the dominion of Buonaparte, for the manufacture of sugar: it was then a forced cultivation, and was abandoned as soon as peace had restored the usual supply of sugar from the colonies; and although the revival of this manufacture in France, where considerable fortunes have been lately realized by it, has induced several speculative individuals, and also a company with a large subscribed capital to re-establish manufactories of beet-root sugar in different parts of Belgium, the Flemish farmers in general are not much disposed to raise the beet-root for sale. They imagine, whether correctly or not, that the land suffers from this crop, when there is no return of manure, as much as it would from potatoes sold off the farm, while the latter are much more profitable: and the carriage of this heavy produce to any distance through roads almost impassable in autumn greatly diminishes the return. The manufacturers of sugar have found, in consequence, that they cannot rely on a regular supply from the farmer, and that they must enter into the cultivation of the beet-root to a large extent on their own account, to keep up a proper supply. The company established near Waterloo have purchased a large tract of land, a great part of which is in woods, which they are cutting down, and converting into arable land for this purpose: on this fresh soil, which is by no means rich, the beet-root appears to thrive well. A large

sugar manufactory is erected at Bruges, another near Ghent, and a smaller near Dixmude, and various other places, which will require many hundreds of acres for beet-root annually, and thus make this root an important article of cultivation. The mode in which this root is cultivated has nothing peculiar in it. The land is ploughed and well manured; the seed is dibbled, as in the garden, in rows a foot or eighteen inches wide and a foot asunder in the rows: when the plants are up they are weeded and hoed by hand; the seed is put into the ground in the beginning of May, and the roots taken up in September and October. A common crop is from fifteen to twenty tons of roots from an acre of land.

This cultivation has not been adopted for a sufficient number of years to ascertain what rotation is most profitable, where beet-root is the principal object. Those who are sanguine think that alternate crops of beet-root and corn may be kept up by good tillage and manuring. The old farmers are of opinion that there will soon be a great falling-off in the crops. Time will show who are right. In the mean time the cultivation of the white and yellow beet, which contain most saccharine matter, is extending rapidly. A small portion only of these useful roots is raised for the cows. They are not supposed to be so good for the milk as turnips, and they take up the whole season. Should the cultivation be greatly extended, it may have a great effect in causing a variation in the usual rotations of crops now generally adopted. The advantage to agriculture of the beet-root sugar manufactory, where good land is not over-abundant, is still problematical.

The *Ruta-baga*, or Swedish turnip, which is so highly valued by the British farmer, is not generally cultivated in Flanders. If a few small patches of it are seen, it is only as an experiment made by some rich proprietor. It does not enter into the regular system of cultivation, and is not so well suited to sandy soils as the turnip.

Carrots grow well in light soils, which have been trenched to a good depth, and they consequently form a part of the regular rotations in all light soils: when they are sown as a principal crop, it is generally next after potatoes, buckwheat, or turnips. The land having been well stirred for these crops is ploughed before winter, and manured with half the usual quantity of cow dung, or of the sweepings of streets, with which is mixed a third part of pigs' dung, from the notion that the smell of this dung keeps off the moles and field mice, who otherwise would injure the crop. This is ploughed in six or seven inches deep, and the land is left so all

winter. In the beginning of April a very deep ploughing is given, two or three inches deeper than the last: twenty hogsheads of liquid manure are then poured over this, and 2¼ lbs. of carrot seed are sown. The harrows reversed are drawn over the land, the intervals between the stitches are dug out with the spade, and the earth thrown evenly over the seed. It is then slightly rolled. Some put on no dung, but only liquid manure, on the land intended for carrots. If the preceding crop was potatoes, the ground is already sufficiently manured, and any additional quantity would have a tendency to produce forked carrots, which is the consequence of over manuring: but if they follow buckwheat, which has had no manure, a fresh supply is necessary to ensure a good crop of carrots. The more the manure is decomposed and intimately mixed with the soil, the better for this crop. When the carrots come up they require to be most carefully weeded: this is the principal expense. It is done by women and children, who go on their hands and knees, and pull up every weed. If carrots were sown in drills much of this labour might be spared, by using horse-hoes between the rows, and small hand-hoes between the plants in the rows. Should the carrots fail, turnips or sparry are immediately sown, that no time may be lost. In May the carrots are thinned out where they grow too close, and those which are pulled out are given to the cows; they are left about six inches apart.

There are two sorts of carrots sown in the fields: the one is the large Dutch orange carrot, common in England, the other is a white carrot, which is very hardy, grows to a great size, and is more productive in light sands than the orange. It has lately been introduced into England: some fine specimens of the root were exhibited at the Smithfield show in December, 1836. From a trial on a small scale, we are inclined to think that it will be a valuable addition to our roots for cattle in winter. The white carrot is that which is generally preferred for sowing in another crop, as flax or barley, which is a common practice. In this case the carrot seed is sown a week or two after the principal crop. The flax or corn grows faster than the carrot, which is thus kept down, and only pushes its slender root deep into the ground without making much top, or swelling to any size. In weeding care is taken not to pull out the carrots, which are easily distinguished from weeds. After the flax is pulled the ground is gone over and weeded again; liquid manure is then spread over, and

the carrots soon begin to grow, and the roots to swell. If the main crop was barley, the stubble is carefully pulled up, and the carrots are then treated as before. Thus by the middle of October a good weight of carrots is produced on land which had already given a profitable crop that season, and a great supply of winter food is obtained for the cattle. Carrots are occasionally sown amongst peas. The peas ripen in July, and are pulled up, and then the carrots are treated as we have been describing. If the row culture were introduced, and the carrots and peas drilled in alternate rows, the success would probably be more complete. This is done in the intervals of the colza or rape with good success. About fifteen small cart-loads of carrots, or about ten or twelve tons per acre, is considered a fair crop. Judging from the produce of about one-eighth of an acre of good sand, in which the white carrot was sown in England, in March, 1836, without manure, the rows a foot apart and well weeded and hoed, the crop would have reached twenty-two tons per acre: the common orange carrot in the same ground did not produce half that weight.

Parsnips are sown in land too heavy for carrots; and in a deep rich loam the produce is very great. They have the advantage of bearing the severest frost, and therefore do not require to be housed, but may be left in the ground until they are required for use. They are not thought so good for milch cows as carrots, but superior for fatting cattle. The quality of the soil must decide which of the two may be sown to most advantage.

There is another root the cultivation of which is often very profitable, although of comparatively small use on the farm. This is chicory, of which the dried roots are roasted and used instead of coffee. A considerable commerce in this root has sprung up lately, which has caused a duty of 20*l.* per ton to be laid on its importation into Britain. It is the same plant which Arthur Young so strongly recommended for its leaves for cattle and sheep, but it has not been found to answer the expectation in this point of view. The root contains a strong bitter, which may be extracted by infusion; it is also used in the brewing of beer, to save hops. It is wholesome, and if it does not impart an unpleasant taste to the beer, there can be no objections to its use. At all events the cultivation of it, whether for beer or coffee, is a part of Flemish agriculture, and deserves to be noticed. The seed is sown in the end of March or beginning of April. It is treated exactly as the carrot, when sown alone. The ground should be

mellow and deep, rather heavy than light, and ploughed or trenched to a good depth. It is sown broad-cast in Flanders, as everything else is; but it would be much better if it were sown in rows eighteen inches apart. The leaves may be given to sheep or pigs; but they give a bad taste to the milk of the cows who eat them. The roots are taken up in September, and are then of the size of a small carrot: they are cut into pieces, and dried in a kiln. In that state they are exported. The price varies much, according to produce and demand. It is not an object of general cultivation, but only by particular persons and in particular soils: the market is overstocked at one time, and a great demand exists at another. Such a produce can never enter into a regular course, but may be raised as circumstances may afford a prospect of sale and profit.

CHAPTER IX.

OF THE CULTIVATION OF FLAX AND HEMP.

Flax may be considered as a staple commodity in Flanders: it employs a great portion of the population, is exported in large quantities, and the cultivation and preparing of it is most perfectly understood there. It may be raised in various soils, but its quality depends much on the land chosen for its cultivation, and on the tillage and manuring. Its roots sink deep, where it has room, and it is generally said, that the roots of good flax should strike into the soil to a depth equal to half the length, at least, of the stem above ground. The soil most proper for this plant, if there is a choice, is a deep, rich, friable loam, neither too dry in summer, nor wet in winter, in short, the best and deepest soil that can be found: but as this is scarcely ever to be obtained to any great extent, art and labour must supply the deficiency of nature; and trenching, working, and manuring must create a deep soil, and enrich it. A porous subsoil, or one that is well drained, is essential. In a course, or rotation, in which flax enters as a principal crop, the whole management of the land should have a reference to the flax to be raised. In the three tables of rotations which we have given on the authority of Mr. Van Aelbrock, it may be observed, that each begins with flax and ends with flax; and there is no doubt that the arrangement of the crops is much influenced by the preparation of the soil required to bear a good crop of flax at the end of

the course. For this purpose a surplus of tillage and manure is given to each crop, so that the soil is deepened and ameliorated at each successive step, and is brought to as perfect a state as it will admit of by the time the turn comes to sow flax. This may remove the surprise which is naturally excited by the amount of tillage and manure given for each crop, which appears, at first sight, far greater than can be required. The quantity of liquid manure poured over the light lands year after year cannot fail to make them rich, and the frequent trenching with the spade must, in the end, transform the whole soil, to a considerable depth, into a compost of rich vegetable and animal matter intimately mixed with the natural earths. It is, in fact, an accumulation of humus which is the best preparation to ensure a good crop of flax. It is not, therefore, to the immediate preparation of the soil for the flax, that its abundance or good quality is to be chiefly ascribed, but to a gradual system of amelioration, which has brought the soil into the high condition required for this plant.

The finest flax is raised in the neighbourhood of Courtray, where the soil is naturally of such a quality as flax requires. In other districts the soil requires more care and culture, to make it produce anything approaching to the quality of the Courtray flax. In some, as in the Waes country, and more especially in the neighbourhood of Ghent, no exertions or manuring can produce flax which will bear any comparison with the best; but they produce very good crops of flax notwithstanding, of a moderate quality; and they find it a profitable crop, which to the farmer is always an important point. If it were not for a course of continual improvement of the soil, they never could raise such flax as they now produce, nor would any sort or quantity of manure, put into the land at the time the flax is sown, produce so large or so good a crop as will grow in land gradually and properly prepared. It is necessary to premise this, in order to prevent disappointment when attempts are made to imitate the Flemish methods. If any one will follow the whole course on a similar soil, the result will probably be the same.

The crops which immediately precede flax in light soils are barley or rye, with turnips after them the same year. In this case these crops are more highly manured than usual, and the turnips have a double quantity of liquid manure. About Christmas, the turnips being taken off, the land is ploughed into high ridges, and the intervals dug out: it remains in that state secure from wet, and

exposed to the winter's frost. As soon in spring as the weather permits, the land is again ploughed and well harrowed, to let the seeds of annual weeds vegetate. A month after, another deep ploughing and harrowing are given, to bring the land into good tilth, and clean it well. Peat ashes are now put on at the rate of thirty bushels to the acre, and these are spread and harrowed in; a few days after ten hogsheads of strong liquid manure,—the emptyings of privies is preferred,—is poured regularly over, and thus it is left for a week or ten days, that the manure may soak in. The seed is then sown: the quantity varies, but is always very abundant; 160 lbs. are generally sown on an acre. The seed is slightly covered by a bush-harrow or the traineau drawn over the land: more than half an inch of earth over it would prevent its vegetating. Cloudy or showery weather is chosen for sowing it, as a very hot and dry air might also prevent its rising. The best seed is imported from Riga. The first crop of seed raised from the Riga seed is sometimes used, but it is supposed to degenerate fast; and the home-raised seed is said to produce coarse branched flax. This, however, is maintained by others to be a mere prejudice; and it is recommended to sow a spot thinly, and give the plants room to grow and perfect their seed. The flax of these plants will be much inferior, but the seed will be good and plump, and equal to the Riga seed for sowing. The question arises still which is the cheapest method, to raise seed thus, or to import it: this is a matter of simple calculation, and we must leave the flax growers to decide it.

About Courtray the method is somewhat varied, the flax is sown earlier; the soil being peculiarly suited to this crop, less preparation is required. The preceding crop, which is frequently colza or oats, receives a double portion of manure: some very rotten dung is ploughed in with the stubble, and is completely decomposed during the winter. Early in spring the ground is ploughed and harrowed across, liquid manure is poured on as before, and the seed is sown. The quantity and nature of the manure depends on the state of the soil as to fertility, especial care being taken that no hot dung be used, and nothing which by any chance can increase weeds. Rape cake, dissolved in urine, or ground to a powder, is a favourite manure. Six hundred to one thousand rape cakes, and one thousand gallons of urine, are often put on an acre of land on which flax is to be sown. It is an essential condition, that previous to sowing the flax-seed the land be quite clean and free from weeds.

Clover-seed or carrots are often sown amongst the flax, but many careful cultivators allow of no mixture, or anything to divide the juices of the soil with the flax. It is evident that in ground so highly manured the carrots or clover cannot fail to grow well; but they are weeds as regards the flax, and therefore it is thought that they should not be allowed to grow amongst it. The next operation is to weed the flax, as soon as it is a few inches high, and can be readily distinguished from the weeds. This is done by women and children, who from custom delight in the work: they go in parties, and generally work cheerfully together; with coarse cloths tied round their knees, they creep along on all fours, which injures the young plants less than if they walked; they go against the wind, in order that the plants which are laid flat by their creeping over them may be blown up again into an erect position, as soon as they have passed over. This proves what minute attention is paid to every circumstance which can possibly affect the crop. When the ground is quite clean, and the flax is grown to a good height, preparations are made for pulling it. The fibre is in the best state before the seed is quite ripe, and if this alone were the object, the flax should be pulled without waiting for the seed to ripen; but then the seed is valuable for the oil it contains, and forms an important item in the value of the crop. These advantages are to be balanced: and the flax is generally allowed to stand till most of the seed is ripe, or nearly so. Much judgement is required to ascertain the exact time when there is a maximum of value, and each grower solves this problem for himself.

When the flax is pulled it is laid on the ground in small parcels to dry. As soon as the capsules which contain the seed become dry, and break readily on being pressed between the finger and thumb, they are taken off by drawing the flax through a rippling machine, which is a kind of comb with blunt iron teeth, which separates the capsules from the stalk; and they are saved in bags or baskets. The flax deprived of the seed is now tied in small bundles, and, in some places, immediately put into the water to steep; but about Courtray, where every process is carried on in the greatest perfection, and where steeping flax is a distinct trade, the flax is placed upright in rows as soon as it is pulled, the root end spread out, and the tops resting against each other in the form of the letter A, or the rafters in a roof: they do this so skilfully that the rain has little effect upon it, and, unless it

blows very hard, the wind does not overturn it. In a week or ten days, if the weather is dry, it is collected into thick bundles of 8 or 10 lbs. weight each, and firmly tied. In this state it is stacked in the field, or deposited in a barn. The seed is beaten out at leisure in winter, and the flax is not steeped till the May after.

The method of steeping is the same at whatever time it be done, and the following is the common process. A piece of water over which alders grow is chosen in preference, as the leaves of that tree steeped in the water give the flax a peculiar tint, which is thought desirable; or if such a place is not at hand, alder leaves are sometimes tied up in the bundles of flax. It is thought that the alder leaves also drive away insects which injure the fibres of the flax while steeping. The best and most experienced steepers, however, disregard these notions, and prefer the clear soft water of the river Lys, which they confine in long ponds made for the purpose along the side of the river, of such a depth that the flax may stand nearly upright in them without touching the bottom. This requires a depth of five feet or more. If they cannot be made so deep, the flax must be placed in a slanting position in the water, the root end lowermost, and the upper end a little under the surface of the water. It is kept in this position by means of mats spread over it; and poles with stones placed on them keep the mats down and the whole under water. If the steeping takes place in August the fibres will be sufficiently loosened from the woody parts of the stem in a week. In October it will take double that time, more or less, according to the temperature. The warmer the air is the sooner the flax will be steeped. In May it takes somewhat less time than in October, and the flax steeped then comes out of a lighter colour than that which is steeped while green.

Some steepers tie the bundles together in pairs, the root end of one to the seed end of the other, so that half the flax leans upwards in the water and half downwards: but there seems no good reason for this practice, for as the root end is sooner steeped than the upper, it will be unequally steeped, even if the flax be laid horizontally in the water, which is not thought so good as placing it vertically or nearly so. But as these men have great experience in the process, we must hesitate before we blame a practice of which we do not immediately see the advantage. Those who steep the flax in the Lys itself collect it in thick

bundles nearly a foot in diameter, and somewhat longer than the flax, by laying several small bundles together, as described above. In these large bundles the roots project at each end, and the tops are inside. They are tied round very tight in two places, about six inches from each end. They are then placed upright, and closely packed in a cage, or open frame, made of wood and laths, ten feet square and four deep: boards loaded with stones are placed over the top, so as to sink the whole a few inches below the water of the river. Thus the water runs over and under the frame, and is continually changed. The consequence of this is, that the flax becomes of a clean white colour, without the usual bluish tint, and is therefore more valuable. The time of steeping is somewhat longer than in stagnant water. It is pretended by those who do not adopt this method, that there is a considerable loss in the weight of flax steeped in this way, which counterbalances the superior value. This is, however, not clearly proved, and the quantity of flax which is brought from a great distance to be thus steeped is a presumptive proof that this method is, on the whole, the most profitable, and the best.

The flax is frequently examined, when it is nearly steeped enough: if it be left a few hours too long in the water the quality is injured, and if it be taken out too soon the whole fibre will not be detached, but will break in the scutching. As soon as the fibres separate from the woody part, the whole length of the plant, it is immediately taken out of the water, the bundles are untied, and the flax is spread out to dry on a piece of short grass, the place having been previously well swept, that no earth or dirt may be on it. In rainy weather this process is deferred, as rain would now injure the flax materially. It remains on the grass ten or twelve days, and is frequently turned over during that time. It is then housed, and in the course of the winter it is scutched and heckled, operations which, not being necessarily connected with agriculture, need not be described here.

The capsules containing the linseed, which were separated from the stems before they were steeped, are spread on cloths in the sun, to thoroughly dry them; after which they are stored in a dry granary, until the seed be wanted for crushing or for sowing. The seed which is beaten out in winter is better than that which has been separated from the capsules at first, because it has had time to ripen, and to convert more of its mucilage into oil. The Flemish flax seed, when sown, produces more seed than that from

Riga, but the flax is inferior. Hence fresh Riga seed is bought every second year. Next to Courtray, for the growth of good flax, are Roulers, Thielt and Oudenarde; the Waes district comes next, with Termonde and Alost: that from the neighbourhood of Ghent is inferior.

An acre of good flax near Courtray is worth from 20*l.* to 25*l.*, without reckoning the seed, which is worth 5*l.* or 6*l.* more. Merchants come out of France and Brabant to buy it, as it is pulled and tied in bundles. They have it steeped at their own expense by the regular steepers. In other districts the flax is of less value, in some not above half the sum. When it is considered that wages are not much more than half of what they are in England, it will be seen that the rent and profits of an acre of land fit for the growth of flax must be considerable; but it must be observed, that this golden crop only recurs every nine or ten years; and the continual manuring of the land must in part be set off against this crop, which some how or other considerably reduces the fertility of the land.

Hemp is not cultivated so extensively as flax, but as it forms a principal produce in the Waes district, where there are some considerable rope and cable manufactories, and is cultivated with some care, it cannot be passed over. The best soil for this plant is a good deep loam, such as is found in spots in the Waes district, and near Alost. The hemp raised on this soil is long and of a strong texture, and consequently well adapted for cables, cordage, and strong canvas for sails. In lighter soils the hemp is sown thicker, and does not attain the same size or strength.

The soil on which hemp is intended to be sown is ploughed in autumn and again in spring. In the middle of May it is manured with fifteen tons of good rotten dung, which is immediately ploughed in, unless the land had been manured in autumn, which is the better practice, as then the dung is already in a decomposed state at the spring ploughing. In some small farms the hemp-land is trenched and prepared with the spade, and it amply repays the additional expense. In either case the liquid manure is not omitted, especially if *vidanges* can be procured: five tubs of this last, each as much as a horse can draw on the land, are considered as good a dressing as fifteen hogsheads of the common tank liquor, which is chiefly cows' urine. This manure is allowed to sink into the soil for three or four days; the land is then harrowed, and about half a bushel of hemp seed is sown per acre. The seed

should be heavy, shining and dark-coloured, and of the preceding crop: in three or four days the plants make their appearance, and soon after this they are carefully weeded and thinned out by hand. In very good soils, and where strong hemp is required, the plants are left six inches from each other. The strongest plants are pulled up in preference, as the male plants, which produce no seed, appear first. The names of male and female, as applied to the plants of hemp by botanists, are usually inverted by the hemp growers. They call that which produces the seed the male plant, and that which is barren the female. These names were no doubt used before the sexual system was well understood; but we shall call that the female which bears the seed. The male plants arrive first at maturity, at the time when the flower sheds the pollen which impregnates the female. They should then be gathered, as they would wither and become useless, if left till the seed was ripe on the female plants. This taking out the male plants does good to those which remain; and in order that this may be done without breaking the females, the seed should be sown in narrow beds with paths between them. From this circumstance arises a practice of sowing hemp in a border all round a garden or potato-ground, or in rows, with potatoes between them.

When the female hemp is fit to be pulled, the plants are drawn out of the ground with the roots, and tied in small bundles about six inches in diameter. These are placed against each other in a circle, the heads forming the apex of the cone. If the weather should be very rainy while they are in that state, the heads are sometimes protected from the rain by a covering of straw, but this is not a common practice. If the weather is fine the whole is sufficiently dry in a week or ten days: the seed is then taken off by means similar to those employed for flax, and the hemp is steeped.

The female hemp requires the least time for steeping: a week or ten days in the water is sufficient to make the fibres separate from the wood. If a much longer time is required, it is a proof that the hemp was either pulled too soon or allowed to stand too long.

Rye or wheat is usually sown on the land which has borne a crop of hemp. Sometimes turnip-seed is sown amongst the hemp when the male plants are pulled up, but this is scarcely worth while, and the return seldom repays the trouble. Before the whole crop is pulled, if that takes place in September or October, the rye or

wheat is thrown amongst it; the pulling of the stems covers the seed, and no other tillage is required. A slight application of the liquid manure soon makes the corn spring up; this saves ploughing and harrowing.

The produce of an acre of hemp in Flanders is about 350 lbs. of hemp, and from thirty to thirty-five bushels of seed, if the soil is good and well cultivated. It is not usual to sow hemp repeatedly in the same ground, as is done in many other countries, and also in parts of England, where a hemp land is a name given to some enclosure near the farm-house, which from time immemorial is the only spot where hemp is ever sown. The Flemish farmers have no hemp lands, and they seldom sow this crop again in the same spot in less than eight or ten years. Hemp requires so much care and manure, that it is not a favourite crop: it clears the land from weeds, and is a good preparation for wheat, but flax is upon the whole more profitable, and therefore preferred.

When hemp has been steeped and dried, the fibres are separated from the wood by hand, or by a mill which crushes the woody part. This mill consists of a stone of a conical shape, revolving on another circular stone laid horizontally as in a cider-mill; the wood is thus broken and afterwards easily separated from the fibre by beating and combing, but it is more commonly separated by hand; and the hemp thus treated is preferred. It is an easy employment for old people and children, by the winter's fire, or in a summer's evening, but it is too tedious to answer on a large scale.

CHAPTER X.

PLANTS CULTIVATED FOR THEIR OILY SEEDS, SUCH AS COLZA, NAVETTE, POPPY, AND CAMELINE.

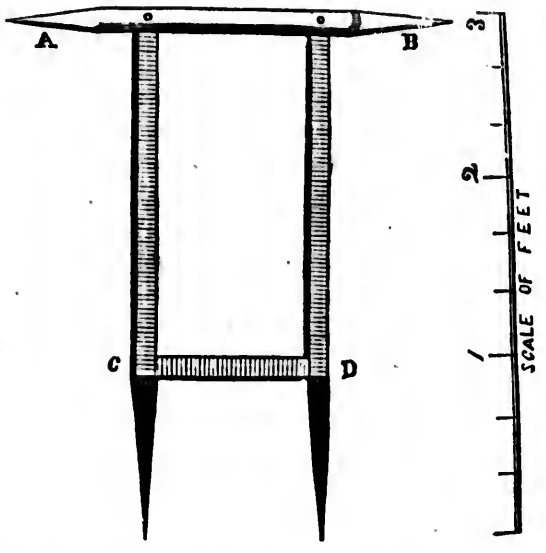
Besides the seeds of flax and hemp, which are crushed to obtain the oil which they contain, there are other plants which are raised for this sole purpose. These are mostly varieties of the Brassica family, at the head of which stand the Colza or *Brassica Campestris*, and the Navette, or *Brassica Napus*, both of which are sometimes confounded under the common name of *rape* in England. Almost all the seeds of the cruciform plants contain oil which may be expressed to advantage, and so do the kernels of most nuts, and the stones of fruits.

The colza is a plant which requires a good and rather strong soil, as well as a careful cultivation. In Flanders it enters into the regular rotations on all good heavy loams, and is thought an excellent preparation for wheat, as may be well supposed, when it is considered how the soil is tilled for this plant, how much it is manured, and what care is taken to keep it clear from weeds.

In the polders, where fallows are still occasionally resorted to, colza often supplies their place. It is sown broad-cast in July, as turnips are. The ground is ploughed in autumn and in spring, and again a short time before the seed is sown, and well manured with farm-yard dung. The seed is sown very thin, and harrowed in: as the plants come up they are weeded and thinned out, so as to leave them nine inches or a foot apart. Before winter they have acquired a considerable size, and the stems have had the earth drawn up to them. Thus they remain all winter without injury from the frost: in spring they are weeded again, and the earth gathered round each plant, which ensures a vigorous growth of the seed-stem. After flowering in April and May the seed-pods fill, and begin to get ripe in June or July: care is taken to cut the crop before the pods are fully ripe, or they would shed a great part of the seed. Dry, warm weather suits this best, as then the stems may be laid on the ground for a short time to dry, and the seed may be immediately thrashed out on a cloth in the field, which is soon accomplished if the weather permits. The crop is then safe, and is stored in a dry and airy granary till it is sent to be crushed.

But this is not the mode in which colza is cultivated in the other parts of Flanders, as there fallows are unknown, and the land is never left idle. The seed is sown in a bed of good earth, prepared on purpose to raise plants to set out after harvest, when the land has already yielded a profitable crop. These plants are taken up carefully in October. When the stubble has been cleared of weeds by the harrows, the land is well manured, ploughed to a good depth, and laid in stitches: the plants are then brought in baskets to the field. A man, with a wide spade made on purpose, opens a gap in the soil, by planting in the spade vertically, as far as the blade will go, and then pressing the handle towards his body: a woman or child with a basket or bundle of plants immediately sets one in each corner, and the spade handle being replaced in a perpendicular position, the earth falls back upon the two plants. The man, when he has drawn out the spade, puts his foot

between the two plants, and thus presses the earth against their roots. The whole of this operation is performed in far less time than we have taken to describe it; in fact, practice gives such dexterity that a double row of plants is set in a very short time all along the bed: the next double row, which is set in returning, is eighteen inches distant from the first, and the plants are placed so as to alternate with those in the first row. Instead of a spade some use an instrument called a *plantoir*, which makes two holes at once, and is pushed in with the foot pressing on the cross bar C D, (see fig.) while the handle A B is held in both hands. In



this case a plant is set in each hole by a person following the dibbler, and the earth is pressed to it by the foot. Whichever way the plants are put in, some will always fail, and a supply is kept in the seed bed to replace them at any time in autumn or spring. The intervals between the rows are hoed and weeded, and even sometimes dug with the spade, which is a good practice; and the plants are treated as cabbages are in a garden. In November, before the frost sets in, the intervals between the stitches are dug out, and the earth placed in small heaps between the plants, both to receive the mellowing influence of the frost, and to protect them against very cold winds, which, when there is no snow, sometimes injure the young colza. In spring these heaps are levelled, and the earth is raised around the stems. They cannot fail to grow

and shoot out strong seed-stems and succulent leaves. These leaves are much relished by cattle, and this sometimes induces the small farmer to gather a portion of them for his cows, at a time when fodder is scarce; but he pays dear for this supply, by the diminution of the seed, which is abundant in proportion to the luxuriance of the leaves on the stem at the time of flowering.

When the colza is cut, it is thrashed, as described before, unless the weather be very unfavorable; in that case it is dried, as well as circumstances permit, without much handling: it is then laid in layers with dry straw, and stacked in the field, or carried to the barn. This plan is, however, seldom resorted to in Flanders, the season in general permitting its being housed in a dry state, if not threshed in the field.

To save time and trouble the plants of colza are sometimes put in with the plough, being set in the furrows, as we have described in planting potatoes, with this difference, that the plants are set upright, or rather slanting a little against the furrow-slice last turned up, and the return of the plough covers the roots, leaving the crown above ground. A man goes along the furrow, and with his foot presses against each plant to settle the earth around it. This method is not so much practised in Flanders as it is in other parts of Belgium, where the extent of farms is much greater, and where so much labour cannot well be spared for each crop. It is a less perfect method, and the plants do not take root so certainly, or grow so well as by the other.

An acre of good colza produces on an average thirty bushels of seed. In March, after the colza has been hoed, carrot-seed is often sown in the intervals: it comes up well, and after the colza is reaped, and the ground has been cleared of the stumps which remain, the carrots are thinned out, and get to a good size before winter.

The colza is sometimes sown thick and broad-cast, to serve as food for cattle and sheep in winter and spring, but the *Navette* (*Brassica Napus*) is more usually sown for this purpose.

The *Navette*, which is also called *Rabiolle*, is a plant of the cabbage tribe, which grows well in lighter soils than suit the colza. If it were not for this peculiarity, the colza, as more productive of seed, would always be preferred. The navette is not usually planted out, but sown broad-cast, and thinned out. If it is sown in spring it will run to seed in autumn, but its produce will be less; if it be sown in autumn it will stand the winter, and seed

early in the next summer. This is the preferable method, as it may be sown after harvest, and when it is ripe there is good time for a crop of turnips after it. As a green crop is excellent for sheep, and may be advantageously sown, to produce early food for them in spring. It is, however, not so much cultivated in Flanders as the colza. The seed produces an oil of similar quality.

The poppy is cultivated in Flanders for its seed, from which an excellent oil is expressed, little inferior to that of olives. There is a white variety of the poppy and a purple: the first produces the best oil, the latter the greatest quantity. A rich loamy soil is the best for this plant, as it is for most others which bear oily seeds; and it is prepared in the same manner as for any other spring crop which requires a rich deep soil. Two ounces of seed is an ample allowance for an acre of land, which is ploughed in stitches, and harrowed before the seed is sown: the earth out of the intervals being thrown over the seed, the harrows reversed are drawn over it. In May the plants are thinned to a foot distance each way, for each throws out many stems. In August the seed is ripe, and it is gathered in a manner which will appear tedious, but which is effectual to obtain all the seed in perfection. When some of the heads begin to dry, and the openings through which the seed sheds appear under the crown, men and women go along the rows of poppies, and shake every head in succession over a basket or box hung on the left arm, without breaking the stems: all the ripe seeds which are loose in the head, drop out, and in time the basket is filled, and the seeds are put together in sacks. A few days after the the same operation is repeated, after which the stalks are pulled up and tied in bundles, which are placed upright in the field, that the remaining seeds may ripen: they are then finally shaken out, and the whole produce added together may amount to twenty bushels per acre. The heads and stalks are of little use, and are either burnt on the ground for the sake of the ashes, or are carried home to help to heat the copper in which the food is boiled for the cows, as we shall see hereafter. When the poppy-heads are wanted for the druggists, they are cut off, with a portion of the stalk before the seed is ripe, and when there are no apertures under the crown they are tied together, and hung in a shady and dry place, to lose their moisture. In this state they contain the soporific juice, for which they are used in fomentations, &c. The cultivation of the poppy for this purpose is chiefly in gardens.

There is another plant occasionally cultivated for its oily seeds, which is the *cameline*—(*Myagrum Sativum*)—a plant frequently found in the fields, and eradicated as a weed. It has the peculiar advantage of ripening its seeds in the short space of three months from the time of sowing. It is on this account sown in spring, when the colza, rape, or any other crop, has perished in winter, which sometimes happens, when there are frequent alternations of frost and thaw during that season. The ground being ploughed and harrowed, a small quantity of the seed, less than 2 lbs. per acre, is sown, mixed with fine sand or ashes to distribute it more equally. The bush-harrow or traineau sufficiently covers it; and as it will grow on very poor land, no more manure is required than was left by the last crop. If it is sown in May the seed will be ripe in September, and is then treated exactly as the colza or the navette. The produce in rich soils is less than that of either of these last, but it may be sown where colza would give no adequate return: in good land it is confessedly only a substitute. With the stems of the camelina useful brooms are made, and in some places the plant is cultivated for that purpose: it forms a part of the industry of the small farmers who have but a few acres of land, which they cultivate with the spade, as in the neighbourhood of Alost and the Waes district. It is well worthy of trial in soils and situations where the usual plants cultivated for their oily seeds will not thrive.

Some of the varieties of the *sinapis*, which infest our corn-fields yield a sufficient quantity of oil to make it a question whether they might not be advantageously cultivated, for this purpose, especially on thin chalky soils. In some parts of the continent, where agriculture is little understood, and the fields are sometimes covered with these plants in full seed at harvest, the poor people readily gather them from among the corn, and have the seed ground and pressed for the oil, which they use in their lamps in winter.

CHAPTER XI.

OF THE CULTIVATION OF PLANTS USED FOR THEIR COLOUR IN DYEING, AS THE WOAD, WELD, MADDER;—AND OF HOPS AND TOBACCO.

The Woad (*Isatis Tinctoria*) has been introduced into Flanders for the sake of the blue dye which is produced from its leaves. But it requires great nicety in the preparation, and has not yet been very extensively cultivated. During the reign of Napoleon every exertion was made to raise within his dominions any produce which had generally been obtained from the East or West Indies, as far as the soil and climate of the countries included in his empire would permit; dye stuffs attracted his particular attention, and the cultivation of the Isatis Tinctoria was greatly encouraged. This plant is called *Pastel* in French: it has a cruciform flower of a yellow colour, and large alternate leaves from which the dye is obtained. Although now mostly superseded by indigo from the colonies, it is still used to mix with that dye, of which it improves and fixes the colour. It is cultivated in the neighbourhood of Valenciennes in France, and in some few spots in West Flanders; but that which grows in the south of France near Toulouse and Avignon is considered of superior quality. A good deep loam is the proper soil for this plant, of which there are two varieties: the one which is larger than the other, and preferable on that account, has the leaves smooth, and the seeds of a violet colour. The land on which it is cultivated is laid out in beds, and very highly manured. The manure used is such only as is well decomposed, and it is thoroughly mixed with the soil. In fact, a good preparation for flax will be equally so for pastel. The seed is sown very thin, in March; the plants requiring much room, dibbling it regularly would be an improvement, taking care not to put it in too deep. In the beginning of May the plants are thinned out, if they are too close. They are left from a foot to eighteen inches asunder at least. In the end of June the leaves begin to be fit for gathering, which is known by their bending down, and turning slightly yellow. A dry time is necessary for this gathering, which is repeated three or four times as the leaves arrive at the proper state of maturity. Considerable attention is required to produce the most perfect colour, as well as the greatest quantity of the dye. If any dust or earth adhere to the leaves they should be

slightly washed, and set to dry in the sun. They are the better for a slight drying before they are carried to the mill. They should never be heaped up in the fresh state so as to excite the least fermentation. They are ground into a paste in a mill constructed like an oil-mill. The paste is well pressed with the hands and feet, under a shed, and made into one or more heaps, of which the surface is made smooth. There it heats, and a hard crust is formed on the surface, which must not be broken on any account; all cracks in it are immediately stopped with some of the paste. In a fortnight the fermentation is completed, which is known by the cessation of the strong ammoniacal smell diffused during the time of its continuance. The mass is then broken up, and the crust is well mixed up with the interior parts. The whole is formed by the hands into balls of about 1 lb. weight each, and then pressed into oblong moulds, and formed into cakes like small bricks. These being carefully dried are fit for sale. Whether the cultivation of woad is profitable or not depends so much on the price of indigo, and the demands of the manufacturers, that the cultivation of it to any extent must always be attended with some risk. A small quantity, however, proportioned to the wants of the dyers around, may always be raised with advantage.

The Weld (*Reseda luteola*) is also a plant raised for the yellow dye which it affords. Its French name is *Gaude*. It is an annual plant which grows three or four feet high; its flowers are greenish, growing in long spikes. It is a native of Europe, and found along ditches, roads and woods. It is consequently hardy, which is not the case with the small species called mignionette, so commonly sown for its sweet smell. The weld will grow in most soils, and does not dislike those which are slightly wet, but it is most productive in good soils. It may be sown after rye, potatoes, or turnips, about once in eight or ten years, and without any manure. In southern climates it is sown in autumn, but in the northern always in spring. The seed being small is usually mixed with sand or ashes when sown, and covered only by the bush-harrow or traineau. When the plants begin to cover the ground they are carefully weeded or hoed, and no further care is necessary till the end of summer, when the seed is ripe, and the stem begins to put on a yellow tint. The plants are then carefully pulled up, and immediately taken to a place where they can be sheltered in case of rain; they are set up against walls or hedges exposed to the sun, that they may dry rapidly; when sufficiently dried the

seed is beaten off with sticks, or against a board set on edge, and is caught on a cloth. Bundles or sheaves are then made of the dried plants, and deposited in a dry and airy place under cover; they are sold in that state. A simple decoction of the plant is used in dyeing.

Madder has been long cultivated to a great extent in the rich alluvial soils of the province of Zealand, which forms a part of the kingdom of Holland; but it has also been introduced into the Flemish polders, and an establishment for its cultivation and manufacture has also been formed, under the protection of the Belgian government, by Mr. Van der Plancke, at Drongen, near Ghent. The account of the cultivation of it, which we shall here describe, is partly taken from the "Dictionnaire d'Agriculture," Paris, 1820, and partly from a pamphlet published by Mr. Van der Plancke, Ghent, 1830. The madder is called in French *Garance;* in Flemish, *Meekrap.* It is the *Rubia Tinctorum Sativa* of Linnæus. It comes originally from the southern parts of Europe, or the north of Asia: but it has been long domesticated in the north of Europe, and improved by assiduous cultivation. It has a long herbaceous stem, and roots which, in good ground, extend several feet in length. The outer skin of the root is yellow, the internal part red. It is this root which is the object of cultivation: a rich light soil of great depth is essential to its success. This immediately indicates that trenching with the spade two or three feet deep is a necessary preliminary. The ground should have a supply of humus diffused through the whole mass of the soil, which can only be obtained by a course of high cultivation for a considerable period, and particularly by that of artificial grasses. If there were rich dry old pastures which could advantageously be broken up, which are not often found in Flanders, these would give the best soil for the roots. But then a deep trenching is still required, and repeated ploughings, to render the soil loose and friable. The preparation of the land begins in the autumn, in the manner which we have repeatedly described, when a very good tilth is required for the ensuing spring-sowing or planting. The dung is ploughed in before winter, the *vidanges* or urine poured on in spring.

Madder is usually sown in a seed bed, and transplanted where it is to remain. The seed is sown while yet fresh, for when it is kept till very dry and hard it is a long time in coming up, often as much as a year or two. It is therefore kept moist in sand,

until it is wanted to be sown. A rich bed is made in a garden or field in spring, and the seed is deposited in small drills. The ground is kept watered in dry weather; if the plants come up well they are transplanted when a twelve-month old. The ground on which the plants are set is divided into narrow beds about three feet wide, and two rows of plants are set about a foot apart upon each. Great care is taken both in raising the plants from the seed bed, and in planting them out, not to injure the roots. They are taken out of the earth only in such quantities as may be set immediately, that the roots may not be too long exposed to the air. The instrument for setting them is a narrow-pointed hoe, very like that which is known by the name of the Vernon hoe, so useful in hoeing wheat, but with a short handle. A hole about six inches deep is made with this instrument a foot from the left side of the bed, and the plant is immediately inserted in it; the earth is then pressed round it, and another plant is put in similarly at a foot distance to the right of it. The labourer then retreats a foot back, and sets two more, and so on till the whole bed is planted with two rows of plants. Four rows are sometimes planted in a bed five feet wide; a line is then stretched along the middle of the bed, and two men, one on each side of the line, plant two sets each, one man with the right hand, and the other with the left, one foot being in the interval, and the other on the bed, to press the earth to the plants; by changing sides the fatigue of the position is lessened. In this way it is thought that the finest roots are produced. But there is a readier way, which is to plant the young shoots which rise from the crown of the old plants, and which are carefully taken off with some portion of the root: these shoots are planted as we have described before. It must, however, be observed, that if this last method be long continued in succession the plants degenerate, and are much inferior to those produced from seed.

The after-cultivation of the madder consists in digging between the beds, and hoeing between the plants. The first operation may be performed with the plough, when the extent is considerable, the other with a horse-hoe. Before this is done, however, it is very useful to pour a considerable quantity of liquid manure in the intervals between the beds. These intervals are dug out and stirred, until the roots of the madder reach them, which they will by the second year, and then the surface only is hoed and kept free from weeds. The earth dug out at first is thrown on the beds around the plants.

The green stems and leaves of the madder are often cut down once or twice in the second year, and given to cattle; but although this may be allowed to a small extent, cutting off some of the redundant stems, it injures the root if done too often. Cattle are very fond of this food, but if they eat any of the roots their bones will in time be tinged of a red colour: so penetrating is the colouring matter in it, that even the leaves are said to do this in a slight degree. In very dry climates the mode of planting is reversed, that is, the plants are set in the hollows between the beds or ridges, that they may have more moisture, and they are earthed up from the higher parts; but in the moist climate of Flanders or of Britain excess of moisture is more to be feared than the want of it. In the third year the roots are taken up. In order to do this without breaking them, the intervals of the beds are carefully dug to the depth of two feet, and then the roots are readily disengaged from the earth in which they grew by means of forks and small pick-axes. The expense of this labour is amply repaid by the greater quantity and better quality of the produce. The plough might be used, if it could be made to go eighteen inches deep, so as to reach under the roots, but in this case a plough must be constructed for the purpose. Such a plough is noticed in the "Dictionnaire d'Agriculture" as being used in England drawn by twelve horses; we confess we have never seen it: but the newly invented subsoil plough might be used for this purpose.

When the roots are taken up they are left on the ground to dry partially, so as to become tough, and not break so readily; after which they are put in heaps, and left for three or four days, covered with straw if the weather be rainy. The sooner they are housed after this the better. Every care should be taken not to break the roots. The next operation is to dry them slowly in a kiln, and then they are in a fit state to be sold to the dyers, or to those who prepare the dye.

Hops, of which the cultivation is so well understood in England, are also extensively cultivated in Flanders. But there are no hop-grounds there of any such extent as those of Kent or Surrey. The hops are chiefly cultivated by small proprietors or farmers near Alost, Ypres, and Poperingen: a sheltered spot with a good soil, where the loam is rather stiff, is preferred. Half an acre of hops is a common quantity for one farmer. The preparation of the ground is, again, such as we have so often described for deep-rooted plants. The field having been prepared, and levelled with

the harrows, is divided into squares by parallel lines drawn at the distance of five or six feet, and similar lines at right angles to them. At every intersection of the lines four plants of hops are set, in the month of April, one in each angle, four or five inches from the point of intersection, and four inches in the ground. A few days after the earth is dug out around these sets, so as to form a small circular trench, in which some well rotten dung is deposited and covered with the earth first taken out. As soon as the plants begin to grow, a pole ten feet long is stuck in each intersection of the lines, or sometimes two poles are placed slanting towards each other, to enable them to resist strong winds. The vines as they grow are led towards the poles, and tied to them with rushes, until they are strong enough to take hold of them. If there are more than four, the surplus is pinched off. The first year there is but a small produce of hops; but the intervals between the hop plants are planted with cabbages or beans, or sown with turnips.

In the second year the earth is raised around the plants, and the ground is kept clean with the hoe. Taller poles, fifteen to twenty and even thirty feet high are now placed where the former were, and the mounds of earth round the plants are watered with liquid manure, which soon sinks in. When oil cakes are dissolved in the urine, the effect on the crop is soon perceived by the vigour of the growth. In August the hops are in bloom, and then the earth is again hoed and loosened round the plants. In September, when the flower closes, and a yellow powder appears on it, they are fit to be pulled; the poles are taken down, and the vines are cut about four feet from the ground. The hops are then gathered, and, if possible, dried in the stove the same evening.

In October or November the soil is stirred, and all the remains of the vines are cut down two inches above the root. The earth is dug out all around, and a hillock two feet high is raised over the plants; and so it remains till next spring. In April the earth is removed, and all the tops of the shoots which have grown out in the loose earth are cut off, and when dressed like asparagus are very highly prized by gourmands in Paris. The main shoot is also cut down four or five inches above the ground, and the earth moulded up around it. A hop-garden well cultivated will be productive many years. An acre of hops produces nearly 1600 lbs. of dried hops, which is a large crop, and must be ascribed in a great measure to the liquid manure. The price varies as it does here. If it is less than half a franc a lb. (five-pence) it does not repay the grower.

Tobacco is raised in almost every farm, to a small extent, for home consumption, there being no government monopoly of this drug in Flanders. In East Flanders near Grammont, and in West Flanders near Menin, and along the Lys, the cultivation of tobacco is more extensive. It grows well in light soils, but in the good loams its quality is better. The ground must be well stirred and amply manured, especially with as much rape-cake as can be procured, dissolved in water or urine: 2000 cakes per acre are not thought a great dressing, double that quantity is better. Care must be taken not to use horse dung, and still less the urine of horses: it is too hot and strong, and gives the tobacco a bad flavour. The tobacco seed is sown in March, in a seed bed well prepared, in a sheltered situation. In case of frost the beds are protected by litter or fern, as the young plants are very tender; they are then weeded and thinned out, to give them strength.

The ground having been well tilled and manured, and being harrowed flat, the tobacco plants are set up to the first leaves in holes made by a blunt dibble, and the earth is pressed round them. They are placed in regular rows two feet wide, and fourteen inches from plant to plant in the rows. In a fortnight the intervals are well hoed to a good depth, and each plant has a slight manuring with rape cake dissolved in water. When the tobacco plants are a foot high, the intervals are hoed again, and the earth is drawn up around the stems; when ten or twelve leaves are come out, and the crown or bud is perceptible, it is pinched off with the fingers, which is done to check the growth of the stem upwards. Every lateral shoot is likewise removed as soon as it appears. When the leaves begin to grow yellow, it is time to pull them. This is done close to the stem, or the whole plant is cut down at once on a dry day. They are left on the ground for a short time, but are housed soon after sunset. The leaves are strung on packthreads, and hung up in an airy building made on purpose, not unlike the buildings at the paper-mills, where the paper is dried.

As soon as the leaves are dry they are tied by the stalks, in bundles of fifty or sixty leaves: these are hung up in the house, or placed on the floor, and frequently turned, to prevent heating. As soon as the weather is cold they are stacked in heaps: these are frequently examined, and if any heat appears they are taken down, and made up again. As soon as all danger of heating is over, a cloth is put over the heap, and it is pressed down with weights, which tends to improve the quality.

An acre, well cultivated, will produce from 3000 to 4000 lbs. of tobacco. But it is a very precarious crop, and the outlay is very great. The ground, however, is enriched, and will produce very fine crops after it. A few of the plants are left for seed: of these the buds are not pinched off. The seed is ripe in September.

CHAPTER XII.

OF THE MANAGEMENT OF GRASS-LAND.

Along the principal rivers of Flanders there are good natural meadows, which, being flooded once a year in the latter part of winter, and thus recruited by a deposition of mud from the water, produce excellent herbage, which is made into hay every year, without fear of exhausting the soil. Others are situated lower, and are more apt to be inundated at times when the herbage, having already acquired a certain growth, is injured by water. Those which are entirely above the highest level of the waters are considered as inferior in value, and if they are not converted into arable fields, it is because they are of a cold and wet nature, and this kind of soil is peculiarly disliked by the Flemish farmer. They form what are called *sour* meadows, and the proper mode of improving them is pointed out in a memoir written by Mr. Van Aelbrock, which gained the medal offered by the Brussels Agricultural Society, in 1825. It consists in draining, as the fundamental corrective of stagnant water, destroying the coarse sward by two or three crops of corn, enriching by manure and lime, and laying down to grass with choice seeds. In this way a wet, sour meadow is converted into a rich, fine pasture.

These meadows along the rivers are not generally occupied by the farmers of the adjoining lands, but the crop is annually sold by auction, when it is fit to cut. The price thus obtained is much above the rent which the land would let for on a term, but the consequence is that the meadows are not sufficiently attended to, and are allowed to be overrun with weeds and coarse grass; and those which are not flooded annually are gradually exhausted, so as to require manuring with dung or ashes to restore their fertility.

The price of an acre of good grass is from 2*l.* 15*s.* to 5*l.*, and the produce from two or two and a-half tons of hay. The meadows which are not annually flooded are sometimes depastured with bullocks for two or three years, which renders the grass

much finer, and enriches the soil by the dung and urine of the cattle; the treading also tends to destroy many rank weeds, and to give the roots of the grass a firmness which makes it shoot out vigorously.

When grass land is deteriorated by continued mowing, or when the soil is wet and cold so as to produce rushes and coarse weeds, the best remedy is to plough it up, and cultivate it as arable land for a few years. The manure used in this case is lime and ashes; and if a good system of draining were introduced, a thing little practised in Flanders, many a poor sour meadow might be rendered equally fertile with the best. The usual mode is to plough up the sward in autumn, letting it rot during winter, harrow it well in spring, and sow oats in it. The crop is always abundant, and if after this the land were well manured, and laid down again with good grass seeds in a crop of barley or wheat, the meadow would be renovated without loss of fertility; but several crops are usually taken before it is laid down again, and there is not a sufficient attention paid to the selection of good seeds. The sweepings of hay-lofts are thought good enough for this purpose, and the consequence is, that only some of the earliest grasses, which have ripened their seeds when the hay is made, make their appearance in the new meadow: the grass is poor and thin till the natural grasses have sprung up; and all the weeds of which the seeds were ripe are reproduced in the new meadow. Some more careful proprietors select a portion of good grass, and allow it to stand till the seed is ripe; it is then mown or reaped by hand, and thrashed on a floor like corn: thus good grass seed is procured, and the result is a speedy renovation of the meadow. When the meadows are below the level of the waters, so as to be subject to inundations at the time when the grass is already grown, and liable to injury by the muddy deposit, the only remedy is to raise the surface by digging numerous ditches all over the land, and throwing the earth on each side. By this means strips of land are raised above the floods, and in time the ditches are filled with the muddy deposit, till at length they are obliterated, and the whole surface being raised so as to be only flooded in winter, a most fertile meadow is produced. In the western part of Flanders, about Ypres, and from that to Dixmude, there is a tract of land which has evidently been an ancient polder, and is now covered with the richest pasture: it will fatten a moderate sized ox per acre in four or five months, and the cows fed upon it give an extremely

rich butter. This butter is renowned for ship provision, and is exported in large quantities: much of it comes to England, where it is confounded with the Friesland butter, which is of a similar quality. The natural richness of the pastures is the cause why little attention is paid to improve them, or to prevent their being deteriorated; and some of them gradually become so overrun with coarse grasses and weeds, that where the farmer is not absolutely restricted from breaking up the grass, as is generally the case, he finds it very advantageous to convert them, for a time, into arable land. The produce, at first, is most abundant, and this is so strong a temptation to over-cropping, that they are seldom laid down again without being much exhausted, and requiring several years to restore a good sward. Although the weeds are eradicated, the land is not improved. This might be obviated by a more judicious system; and considerable profit might be obtained from the conversion of the pasture into arable land, which might be laid down again in a clean and good state, so that the grass which immediately followed the corn should be abundant, and of an excellent quality for hay, and the pasture, after the first year, as good as ever. In this particular instance the Flemish farmer might take a lesson with advantage from our countrymen in the north, who so well understand the convertible system of husbandry, particularly in Berwickshire, Roxburghshire, and the Lothians.*

The manner in which the hay is made in Flanders differs little from that which is common in England. The mowers hold the scythe somewhat differently: the handle is straight and long, and the end passes over the left arm; the stroke is not quite so free, but the grass is cut close and even, and there are not so many inequalities to be seen in the remnant of the grass, as is often the case in our meadows, when the mowers are not closely watched, and wish to get over their work too rapidly. Clover is not much shaken out, and sometimes it is tied up in sheaves with straw bands like corn. It is always tied up in bundles when sufficiently dry, and thus stacked in the barn. Hay-ricks are not common, except in the large farms of the polders; and where small ricks are made they are usually built round a pole, and are more like cocks than ricks, containing at most five or six tons of hay each. In the neighbourhood of Dixmude and Ypres, however, square

* See account of Select Farms, No. V.; Scoreby, p. 13; Farmer's Series of Library of Useful Knowledge, No. 25; and Blackie on the conversion of arable land into pasture, 1817.

ricks may be seen of forty or fifty tons, and tolerably well thatched, but none have that neat and trim appearance which the hayricks have in Middlesex, of which the sides and ends are pulled, so as to present a smooth surface, and the thatch is laid as neatly as that of a barn.

There are some water meadows along the rivers, with proper sluices to regulate the irrigation, but they are not very common, nor laid out with the same art and regularity that our water meadows are in general; small ditches and open drains, to facilitate the running off the water after a flood, are usually made to assist the simple inundation of the land, and prevent the water from stagnating in any lower spot, where it would injure the grass. The meadows situated above the rise of the rivers are seldom irrigated by diverting a portion of the river in a channel from a higher point, because the fall in the rivers being very small, the length of the canal would be too great to obtain a sufficient fall: where there are falls, they have been taken advantage of to drive watermills; and there are ancient rights which interfere with any deviation of the current.

With the exception of those extensive pastures which we have mentioned in the south-western part of Flanders, there is not much grazing land. Stall-feeding is universally adopted, and the cattle, fed on roots and clover mixed with meal, are only let out occasionally in summer for a few hours in the day, to have a little exercise, and keep them in health. In many farms, especially the smaller, to which no pasture is attached, the cattle never go out of the stable, but have even their water brought to them. In this manner the cows certainly give more milk, and the oxen fatten readily, but they are more subject to epidemic diseases, which frequently carry off a great part of the cattle, without any certain remedy having ever been discovered for this evil.

CHAPTER XIII.

OF CATTLE.

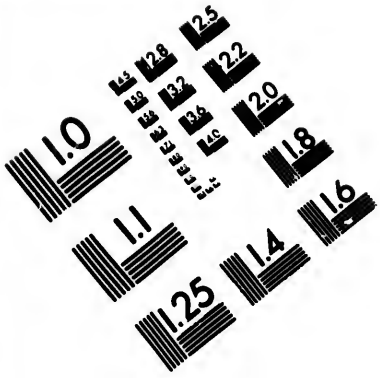
The number of beasts fed on a farm, of which the whole is arable land, is surprising to those who are not acquainted with the mode in which the food is prepared for the cattle. A beast for every three acres of land is a common proportion, and in very small occupations where much spade husbandry is used, the proportion

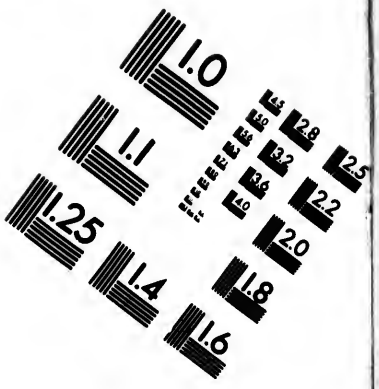
is still greater. To give an idea of the system it is necessary to reflect, that in every farm a fifth, at least, of the land is sown with turnips immediately after harvest. These turnips are not such as are sometimes sown in England under the name of stubble turnips, in the end of August or in September, and give but a poor produce during the winter and early in spring, but they are of a quick growing sort, and are sown in succession from July, after the colza and winter barley are reaped, to August, after the rye, as we have described in the eighth chapter. They are already of a good size in September and October, when they are stored in cellars for winter use. Besides turnips, a considerable quantity of potatoes are raised, more than is required for the use of the family, and these are generally consumed by the cattle. Carrots which have been sown in spring either alone or amongst the barley, flax, or colza, complete the winter's provision. These roots are chopped up together in a tub, and some bean-meal, rye-meal, or buckwheat-meal, is added : boiling water is poured over this, and allowed to cool ; or the whole is boiled together in a copper, when fuel is not too scarce. Of this mixture, which they call *brassin*, two pails full are given milk-warm, morning and evening, to each cow, and this is their food during the whole winter, with a little wheat or barley-straw. Hay is only given in a few districts, where the pastures are extensive, as about Furnes and Dixmude, but never in that unbounded quantity in which the cows eat it in England. Very little hay is made in any other district, and that only clover hay, which is reserved for the horses when they work hard. Near the towns or large villages, where there are brewers, grains are added to the other ingredients of the brassin, and they greatly increase the milk.

The same food is given in greater quantity, and with more meal in it, or sometimes with bruised linseed cake, to fatten cows or oxen. The profit on these, when thus fed, is not considerable, and much under that of the grazier who fats them in rich pastures on grass alone : but the manure produced by their dung and urine is the great object in view, especially where it cannot be procured in sufficient quantities from the towns, owing to the want of water-carriage, and the badness of the roads. A moderately sized ox will eat three baskets of turnips daily, which is the average produce of about the one hundred and fiftieth part of an acre : ten beasts will therefore consume the produce of an acre in fifteen days, or of about ten acres in five months. Two acres of potatoes

and one of carrots will enable the farmer to feed three or four beasts more, by mixing them with the turnips. Some farmers cut all the straw which is given to cattle into chaff, and mix it with the brassin ; it is thus supposed to go much farther than when eaten from the crib : but as mastication causes the saliva to flow, and greatly promotes digestion, it seems probable that there is an advantage in allowing the cattle to chew some dry straw.

A great number of cows and oxen are fattened in the distilleries on the refuse wash, and many farmers prefer selling their cows, when they have had four or five calves, without attempting to fatten them, and rearing young heifers in their place, thus keeping up their stock of milch cows. After comparing the accounts given in a variety of places and situations of the average quantity of milk which a cow gives when fed in the stall, the result is, that it greatly exceeds that of our best dairy farms; and the quantity of butter made from a given quantity of milk is also greater : an ordinary cow fed on young clover will give at three milkings, for the first three months after calving, from fifteen to eighteen quarts per day, which will produce 1¼ lb. of butter, that is nearly 9 lbs. of butter per week. Where the number of cows is great, the average is much less, because when there are only two or three cows, a deficiency in one of them is immediately noticed ; the cow is got rid of, and a better one purchased. In a great number there are always a few inferior cows, and a lower average is the consequence. It appears astonishing that the occupier of only ten or twelve acres of light arable land should be able to maintain four or five cows, but the fact is notorious in the Waes country. The cows are the principal object of attention :—the butter which is sold weekly pays the outgoings of the farm : the buttermilk feeds the family and the pigs : the bread is boiled in it for soup : it is eaten with potatoes instead of butter, it is made into hasty pudding with buckwheat flour : it is the meat and drink of all ; and as long as the cows give plenty of milk there is no want in the house. A falling-off of the milk is immediately noticed, and the food of the cows is increased or changed, till the usual quantity is obtained. But something is also due to the careful selection of the animals. The best cows come from Holland, especially from Friesland ; they are brought over the frontiers in great numbers, and sold in calf to the Flemish dealers. The principal market for them is Malines. Good-sized cows sell for as much as they usually do in our country fairs, that is from 8*l.* to 12*l.* each, with a calf, or when just about





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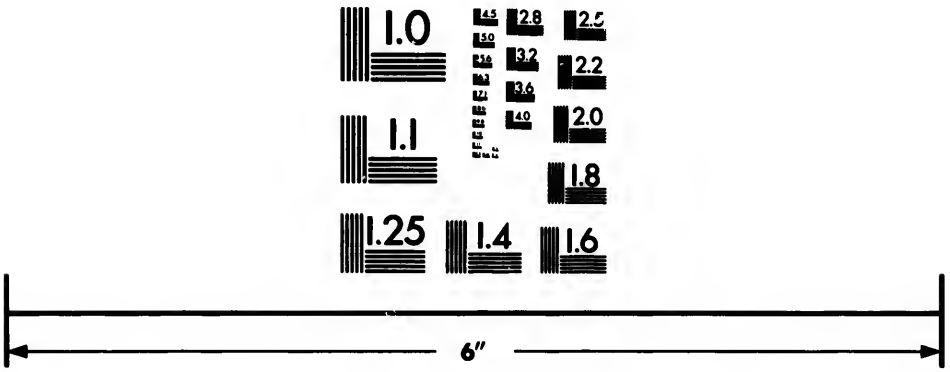

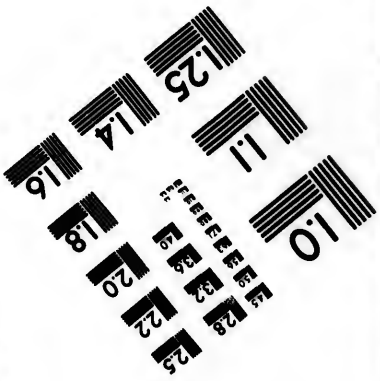

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to calve, which is generally in May. If the calf is a female she is reared; a bull-calf is sold immediately, or fatted for the butcher. There are too few fine bulls kept amongst the small farmers in Flanders to keep up a good breed. There is also a predilection for large heavy animals, from the idea that a large beast is more profitable when fat than a small one, a notion which our Essex and Norfolk farmers, who fat the small Scotch oxen, will not readily allow. When a bull-calf is reared, the largest and strongest in the limbs is usually preferred, even with inferior symmetry, and the produce is coarse, as may be naturally expected. Some very good bulls have been introduced of late years from various countries, and a fine young short-horn bull brought from England is now, or was lately, in the possession of Count d'Hane, at Lovendighem, near Ghent, which will at least serve as a specimen of an improved form. The same gentleman has procured cows from Switzerland and Holstein, the latter a very fine short-horned breed: and under the fostering care of the Belgian government, which pays great attention to every thing by which the prosperity of agriculture can be promoted, a taste for improved forms in the domestic animals cannot fail to be produced. The establishment of a veterinary and agricultural college at Brussels, on an extended scale, will soon diffuse around true notions with respect to the breeding of cattle, whether milch cows, or oxen for the butchers, two things which are quite distinct, and in some measure incompatible. In the mean time the Dutch cows are the best, and eagerly sought after. The oxen preferred for feeding are those which have been worked in the Campine: in Brabant and Namur they are still sometimes used for the plough, instead of horses. At the distilleries they take all sorts of cows, often without sufficient discrimination, and on the rich wash they all get flesh in some reasonable time; but few experiments are made to show what breeds fatten at the least expense, or give the greatest profit. If this were done frequently there would remain no doubt as to the form which fattens most readily.

The cattle are kept on brassin and cut straw till May, when they are turned into the pastures, if there are any. But in all the upland farms where the land is mostly arable, the food is cut for them, and carried into the stalls. This consists of winter barley, or vetches, and clover, chiefly the latter. At first, when the clover is very young, it is given sparingly, and if all the turnips are consumed, boiled potatoes with a little hay are considered as a useful

corrective, for clover, given injudiciously, causes the cows to heave.* By the time the clover is in bloom it is their only food. Clover is not supposed to give the milk or butter any bad taste, as many think in England, although nothing gives so fine and and rich a flavour as natural meadows. The butter made when the cows eat clover does not keep so well when salted; but there is so great a demand for it in the numerous towns and villages, that there never is any difficulty in disposing of it in a fresh state, that is, moderately salted; for as soon as the butter is made a considerable portion of salt is always added.

In the large dairies about Furnes and Dixmude, the milk is set in shallow pans on a cool brick floor in the dairy house, and skimmed, as is the case in England: the cream alone is churned three times a week. A barrel churn is commonly used, which will churn 40 or 50 lbs. at a time. It is sometimes turned by hand, but as this is rather hard work, a horse mill is frequently erected to turn it. The butter, as soon as it is taken out of the churn, is well washed and worked with a cool hand, or a kind of spatula or flat spoon, till all the milk is washed out. It is immediately salted and put into casks which contain about 1½ cwt. If the quantity made at once is not sufficient to fill the cask, it is pressed down, and the surface laid smooth; some salt is dissolved in water, till it is nearly saturated, and this is poured on the butter, so as to cover it an inch deep: a linen cloth is then inserted, and laid smoothly over the butter, to exclude all air, and this is kept down by a round board with a weight upon it: when more butter is added the cloth is removed, the brine poured off, and the new portion added is pressed close to the other. Thus no streak is observable in the place where the different churnings join. The

* Mr. Van Aelbroek gives a curious remedy for cattle which are hoven by eating young clover too greedily. It is as follows:—An ounce of horse-hair is held over the fire with the tongs, and singed till it forms a crisp round ball, which when cold is well covered with butter, so that it may easily be passed into the gullet of the hoven beast. There it sticks, and causes such an irritation, that in a few minutes the animal vomits, and this continues till the stomach is emptied of its contents, and the cow is saved. We have never tried it, but give it on the above respectable authority: should it be efficacious, it is a most simple and valuable remedy, which is always at hand. It is at all events worth trying, where the more certain remedy, by inserting a leathern tube into the stomach, is not at hand. But no farmer who has cattle should ever be without this useful instrument, and we would strongly recommend it to the notice of those who have never used it.

butter made in summer, when the cows feed in the rich pastures, is of a fine golden colour, and to those who do not dislike a little saltness, it is much better when a week or a fortnight old, than when fresh churned, and not salted. It keeps perfectly well for a twelve month or more. The casks are made of clean white wood, and are prepared by well scouring with brine, and rubbing the inside with salt. It is of consequence that they be well made, and air tight. Dixmude is the great market for this butter, which is exported in considerable quantities: much of it goes to Ostend, where it is shipped, and a considerable portion, as we observed before, comes to England as Dutch butter.

In most of the smaller farms the whole milk, after having stood twelve hours in shallow pans, is poured into a deep vat, where it is left to get slightly acid; it is then churned in a large upright churn, and treated exactly as described above. It is allowed that the butter churned from the cream is preferable; but the use of buttermilk is so general, and it is thought so much more wholesome than skimmed milk, that the old method is preferred, in spite of the greater labour required to churn the whole milk. The churning is generally done by a horse, where the number of cows exceeds four or five; sometimes, as in Holland, a dog walks in a wheel, which turns the machinery by which the plunger is moved up and down.

There is little or no cheese made in Flanders, except some skimmed milk cheese for family use, in those districts where the cream alone is churned. The cheese consumed is chiefly of Dutch manufacture.

In the fattening of cattle the same food is used as is given to the milch cows, with the addition of bean-meal, rye-meal, or oats. An ox kept stalled up for six or eight months, and well fed, will double his original weight, and pay well for the food he has consumed: but the principal advantage to the farmer is the increase of the liquid manure in his cistern, and of dung in his yard. Each ox is reckoned to produce as much of both kinds together as will manure two acres of land. When a cow appears to increase in flesh at the expense of her milk, it is a common practice to feed her well, milking her as long as she gives a tolerable quantity, and not allowing her to take the bull. Her milk gradually dries up, and by that time she is so forward in flesh as to be soon fit to be killed: the improvement in her flesh fully compensates for the loss of her milk. There are some farmers who purchase young

cows in full milk, keeping ten or twelve of them, whom they treat as mentioned above; and as soon as one is fat she is replaced by another. If they have skill to select the breeds which fatten most readily, they make a good profit by the milk and the sale of the cow when fat. Abundant food is indispensable for this purpose: the white sugar-beet and the mangel-wurzel are found very good in this case: for milch cows, however, they are thought too fattening.

Very large cows and oxen are fattened in the neighbourhood of Ghent. They are kept stalled longer than usual, sometimes twelve or fourteen months, and are then very fat, especially those which are fed in the distilleries.

The fatting of calves is not so generally attended to in Belgium as in some parts of England, but the method is worthy of notice. In the cow-house there are several narrow boxes parallel to the wall, about two feet wide, six or seven feet long, and three feet high; the door is in the end. Sometimes there is a door at both ends, which is most convenient to clean out the box. In this a calf is placed, so that he can get up and lie down, but he cannot turn round to lick himself. He is fed three times a day with new milk, and where they are curious in veal as near Ghent, white wheaten bread is boiled in milk, with two or three eggs beat up in it, and this mess is given milk-warm to the calf at noon: salt and chalk are also given in small quantities. The veal thus produced is extremely tender and white; and in seven or eight weeks a calf is as fat as is required. A greater price is paid for this veal; and the farmer's wife, who pays due attention to her calves, finds the additional trouble and expense well repaid. Yearling calves are often fatted and killed, but the meat is neither veal nor beef; and it would probably be found more profitable to keep them another year in good store order, and then fatten them off. It is generally those who show an early disposition to increase in flesh that are fatted so early, but for the same reason they would pay much better for the food they consume, if they were kept till they were two years old, and then fatted off. A somewhat similar practice formerly existed in Norfolk: cows were turned out to grass with their calves: between the milk which the calf sucked, and the grass, he grew fat as well as the cow, and they were sold off together. The flesh of these calves was called *beefin*, but the practice is now much less common than it was when more of the the country remained in pasture.

When calves are intended to be reared to keep up the stock of cows, they are treated, for a week or a fortnight, in the same way as if they were to be fatted. The milk is then gradually diminished, and water mixed with it; pulverized oil-cake is sometimes given, and the calves are not placed in narrow boxes, as when they are fatting, but have more liberty; and as soon as they are strong enough they are allowed to run about in a small inclosure or orchard, which tends to develop their limbs, and keep them in good health. They soon begin to pick clover, and when they are about three or four months old they are fed on the brassin and whatever the cows eat.

The young bulls not intended to be kept as such are castrated at twelve months old, and the heifers go to the bull at eighteen months or two years. It is customary for a farmer who has sheep to keep a bull for the use of the parish, in return for which he has the liberty of pasturing his sheep on the stubbles and uncultivated spots over the whole parish.

In consequence of the subdivision of the land, and the small extent of farms in Flanders, no considerable number of sheep can be kept by any individual: the great advantage of folding on light soils is therefore much limited. There are flocks which consist of the sheep of several occupiers in a parish, and which are led about the sides of roads and lanes, to pick up a scanty herbage, under the care of a common shepherd, whose dogs are so well trained that the sheep feed along the sides of corn-fields, and even clover, without being permitted to trespass upon them, although there is no fence of any kind to keep them off. When sheep are fed on the remnants of the clover which has been cut two or three times, lines are sometimes drawn with a plough, to divide a field into portions to be fed off successively. The dogs keep moving along these lines, and not a sheep dares pass over them. Thus all the advantage of hurdling is obtained at a cheap rate, and the land is manured equally and regularly. A small fold may occasionally be seen, in which the sheep are shut up very closely packed during the nights in summer; but in general they are brought into the stable allotted to them in the farm-yard, and remain there till the dew is off the ground. They have straw for litter, and green clover for food in summer: in winter they have straw, hay, and some turnips, but these last are mostly reserved for the cows. The sheep when of a proper age are mostly fatted on corn, and in a very few instances ewes also are kept on extra food, for the sake

of their lambs, which are fatted for the butcher. Lamb is very seldom eaten, except as a great luxury, and is only found at the tables of the nobility and the resident English: we only met with one farmer who kept ewes for this purpose, but he finds it very profitable, being nearly the only person to whom the butchers can apply for a fat lamb early in the season. We shall have occasion to give some further details of this farm.

The indigenous breed of sheep is large and coarse, without horns and with long falling ears. The wool is not long nor of a fine quality, and in nothing is there more room for improvement than in the breed of this useful animal. There is a very small breed from the Ardennes, which is like our forest sheep: the flesh is very well flavoured, and the wool is finer than that of the common breed, but in very small quantity; but this breed is not well suited to the mode of feeding in common practice, and the farmers like to have a large carcase to sell, which bring in more money. Some fine Leicester and Cotswold sheep, and some South Downs, have been imported by the government, and dispersed through the country, but they are mostly confined to the farms of gentlemen, who keep them more as a curiosity than for profit. The Cotswold crossed with the Leicester is a large sheep with a long heavy fleece, and is likely to do well in Belgium. A ram of this breed, which was sent over to Belgium in 1834, gave a fleece the next year which weighed upwards of 20 lbs. The wool was sorted and combed, at Tournay, and 9 lbs. of very fine long wool was the result, besides some good common wool. It was exhibited in the Museum at Brussels in 1835 as a great curiosity. The breed is in the hands of an individual who is likely to keep it pure, and has ample means of raising a good flock. In Flanders it would be almost impossible, with the present system of agriculture, to introduce our sheep-farming system; but in other parts of Belgium, where the farms are larger, there is no doubt but the raising turnips to be fed off by sheep folded on them, would be highly advantageous to the land, and that a good profit might be made by the improvement of the wool and carcase.

Many hogs are fatted in Flanders, pork being the chief animal food of the labourers: every farmer rears pigs, and has three or four hogs in the stye, which are fed with meal, potatoes, and buttermilk, and in time acquire a good size. But the common breed is by no means good, nor is the mode in which they are reared and fed, while in store order, to be commended. They are very

long pigs, with hanging ears, long legs, thin flat bodies, and falling rumps,—the very reverse in every point of what is thought a well-shaped pig in England. The flesh is not ill flavoured, but there is very little fat on the ribs, and the bone is large out of all proportion. It takes six months to fatten a hog of fifteen score, put up to fatten at eighteen months old, and at the end of that time we should only call him half fat in England, the fat on the chine not exceeding three or four inches, and on the sides scarcely two. The cause of this is the defect in the breed, and also the poor starved state in which the pigs are kept when young, having little to eat but what they pick up in running about the yards, and the weeds which are pulled up in weeding, which for want of better food they devour. If clover or a few potatoes are given to them now and then, it is as a treat. The expense of fatting these pigs is proved to demonstration by the price of pork in Flanders, which is higher than mutton or beef. If pigs were fattened with less food, this price would be an inducement to the small farmers to fatten them for sale, which is not usually the case. The pig markets are supplied by the millers and distillers, who fatten them on the offal of their trade, more than by the farmers.

The government, aware of the superiority of the breeds common in England, have imported a number of pigs of chosen breeds from this country, and they are spreading fast through Belgium. The superior form and aptitude to fatten of the Berkshire and Essex pigs, and crosses of these with the fine skinned Neapolitan and the prolific Chinese breeds, begin to overcome the prejudices of those who persisted in preferring the old breed; and it will not be very long before the whole race of that extremely useful animal will be completely changed and improved throughout Belgium. At the same time the farmers will learn the advantage of keeping their store pigs in good condition when they are young, advancing the period when they may profitably put up to fatten, and accelerating the growth of muscular flesh without much increase of bone.

The hogs when fattening are generally shut up in a dark stye, and fed in stone troughs. The best mode is to shut each hog in a small stye by himself, and let him eat and sleep without being disturbed. The dung of hogs is thought inferior to that of cows as manure, and therefore the pigs are not allowed so much litter as is proper; but this is an error, as is well known to those who fatten many hogs, and who can compare the effect of pig's dung when properly mixed with straw, and allowed to ferment in a heap,

with that of an equal quantity of cow-dung treated in the same way. The gardens of poor cottagers in England have seldom any other manure than that of their pigs, and the luxuriance of their cabbages and potatoes shows the strength of the manure.

The pork is generally salted in tubs, and kept in the brine, the chines and hams only being hung up to dry, or smoked; dry bacon is seldom if ever met with. The common hogs are too thin in the sides to make good flitches, and if the spare-ribs were taken out, there would not remain sufficient substance left to make good bacon.

CHAPTER XIV.

OF THE BREED AND MANAGEMENT OF FARM-HORSES.

The horses of Flanders have been long noted for their bulk. Flanders mares were at one time in request for the heavy town carriages of the nobility and men of fortune in England and on the Continent. Since the improvement in the roads, and in the paving of streets, activity has been preferred to strength, and the English carriage horses now partake more of the breed of hunters, and are more nearly allied to full blood. The Flanders horses are probably the same at this time as they were a century ago, but compared with the present breeds of coach and cart horses in England, they are inferior. They are in general large in the carcase, and pretty clean in the leg, patient and enduring, if not too much hurried. They are steady in the collar, and good at a dead pull, in consequence of their weight, but they are very heavy in the forehand, inclined to get fat, and deficient in activity. They fall off in the rump, and the hips stand out too much from the ribs. The worst point in most of them is the setting on of the tail, which is low and pointing downwards. These are the general characters of the real Flemish horse A more useful kind of horse, although not so sleek, is found in the provinces of Brabant and Namur, where they draw heavy loads of stones and coal over bad roads. The feet of the Flemish horses are generally flat, denoting the moist pastures in which they are fed when young, or the dung of the stables in which they have stood, for many of them have never been turned out loose, and have been reared and fed in the stable as the cows are. This will account

for want of vigour and muscle, as well as for the propensity to get fat. The food of the farmers' horses is not calculated to produce hard flesh: green clover in summer, and roots with cut straw in winter, are the chief provender. A few oats are occasionally given, and some clover-hay, but not in so regular a manner as to give great muscular strength. From the badness of the roads there is little to do for the farmers' horses in winter. They are often kept idle in the stables, and according to the maxim, that he who does not work should not eat, their allowance is much diminished at that time. They have consequently but little vigor, when the spring brings with it a continued demand for exertion in man and horse: washy food fills the celular substance, and the skin is sleek, but there is no great power in the muscles. They look like the cart-horses which our dealers *make up* for sale, by giving them boiled grain and other nutritious food. When they are put to hard work they sweat and pant from an excess of loose fat, and consequent deficiency in wind. When the season comes for ploughing and sowing, in spring, the horses are better fed: they have oats and cut straw, besides clover-hay; and by increasing their work gradually, they soon come to do a good day's work. They are generally at work soon after four in the morning, or as soon as it is light, and work steadily till ten: they are then brought home, the harness is taken off, and they feed and rest till two or three, when they resume their work, and continue at it till six or seven. In harvest-time they work from day-break till evening, resting only a few hours in the heat of the day.

The great object in the Flemish system is to feed the stock at the least possible expense. The generality of the farmers have no meadow-land, and if they use hay it is purchased at a considerable price. Potatoes and carrots, of which ten or fifteen tons can be raised on an acre of land, are much cheaper, and if they require more manure they also produce more. With oats and cut straw, or wheat-chaff, and occasionally a little clover-hay, the roots keep the horses in very good health, and slow-working condition. The carrots are given raw, but the potatoes are generally boiled, and given mixed with chaff. In every stable there is a cistern constantly filled with water, with some bean-meal stirred into it. This greatly assists the food they take, and it is supposed that meal given in water goes farther than in any other way. If it were boiled to a thin gruel it would probably be still

more nutritious, for then the particles of the starch, which cold water does not dissolve, and which often pass undigested through the stomach, would have given out their gummy contents, and become dissolved in the water. But it is impossible to unite the greatest economy in feeding horses with that condition which enables them to make great and sudden exertions, and which keeps up a high courage. In this case dry oats and good hay are indispensable. In the neighbourhood of Dixmude and Furnes, where there are extensive pastures, the horses are put out to grass in summer, and fed with hay and oats in the stables in winter: straw and clover-hay are cut into chaff to mix with the oats; roots are given occasionally, but do not form the principal part of the food, as they do in East Flanders.

The Government has been at great pains to procure fine stallions, to improve the native breeds. High prices have been given for some strong, full-bred English horses; but such are the prejudices of the farmers, that although nothing, or a mere trifle only, was charged for covering a mare, some extremely fine horses were sent into several districts without any one appearing anxious to avail himself of such an opportunity. They seemed to fear that some invidious design was concealed under this apparent liberality: but when they find that those who have bred colts of the improved cross have obtained a much better price for them than for those of the old breed, they will probably see their error. If some well-shaped mares from Yorkshire or Lanarkshire had been imported, as well as stallions, a better breed would have soon been produced, by crossing both ways.

When the British army returned from Belgium after the battle of Waterloo, some fine-looking horses were bought at a very reasonable price, and, from their bulk, were thought equal to our dray-horses. Many were imported into England by dealers, who realized great profits; and the Belgians naturally concluded that their breed of heavy horses was better than the English, or else why import them? But this trade is nearly at an end. A few of the best-shaped horses have turned out well, but the great majority of them have disappointed the purchasers. They are slow and heavy, and are not to be compared, for farm or road work, to our active north-country horses, or our Suffolk punches, which much resemble the Flemish horses in colour, and were probably of Flemish origin, improved by careful selection in the breeding.

There are not nearly so many foundered horses met with in Flanders as there are in England, which must be attributed more

to their being less severely worked than to their being better shod. The manner of shoeing is heavy : the horses are tied up in a strong frame or cage, to which the foot to be shod is firmly tied, so that, even if he be pricked to the quick by a nail, he can only exert the muscles of his legs in vain, and strain himself, but he can neither escape nor defend himself.

The horses are harnessed with heavy collars and rope traces. The weight of the harness is much increased by making the collar so large ; and, as every additional weight must add to the fatigue of a day's work, it is a useless waste of strength ; but any attempt at alteration or improvement would, no doubt, be strongly reprobated. The horses used in the towns draw enormous loads on carts and waggons of various descriptions. Some of these have the body of the waggon sunk low between two large wheels, the axletree being bent for the purpose. In front are two small wheels placed near one another, and turning round under a kind of crane-neck, which forms the fore-part of the waggon. This form is very convenient in towns for loading and unloading goods. In the country they use carts and waggons not greatly different from our own. A pair of horses and one plough are thought sufficient for forty acres of arable land, the whole of which is, on an average, ploughed twice, and harrowed three times every year. This alone will give work for above two hundred days, without reckoning the carting of fodder and manure, and harvest-work. The horses should be well fed to stand all this work. The value of a strong young cart-horse is, on an average, about twenty pounds. In England a similar horse would be worth thirty pounds, or more, which accounts for the importation of Flemish cart-horses into England. It is supposed in Flanders, that the English dealers buy Flemish mares to breed from, which is a great mistake. Here and there a mare may be found with good proportions, and from her size a breeder might be tempted to give her a good moderately sized half-bred horse, in hopes of producing strong coach-horses ; but the common faults of the breed, the coarse neck, large belly, and falling croup, would probably appear in the progeny, even if the English cross infused some spirit and life into the produce. We are not aware that any good horses have been lately bred from Flanders mares : besides, the dealers buy the geldings in preference, when they can get them. The importation of horses from the Netherlands is therefore a mere speculation, the price being lower there, and the import-duty trifling ; but the trade is falling off, in consequence of a rise in the

price of good horses in Flanders, and a smaller demand for them in England. The most useful horses for work are to be met with in the Walloon country and the provinces of Namur and Luxemburg. Some of these horses, when well fed, have good figures, and this breed would be much better to cross with our active half-bred horses, than the Flemish. They are sometimes found in Flemish farms in preference to their own heavy breed; and the public carriages in Flanders are almost invariably drawn by horses which have been imported from other provinces.

Asses and mules are very seldom seen, which we are surprised at, for an ass might be kept on the very small farms, to do the work which is now frequently done by men, such as drawing harrows, wheeling manure to the land, and bringing home the produce. The only use to which asses are put seems to be to carry women and their panniers to market. Those asses, however, which are met with are all in good condition, and show that they have been liberally provided with food, instead of being half-starved on commons and in lanes, as they are often with us.

CHAPTER XV.

OF GARDENS, ORCHARDS, AND WOODS.

To every farm there is usually attached a good kitchen-garden, which is well stocked with vegetables and in situations where the soil is favourable to fruit-trees there are a few orchards, but none so extensive as in many other countries where cider is made. This beverage is not much used in Flanders, beer being the favourite liquor; hence the cultivation of fruit-trees is chiefly to supply the towns with their fruit. They are never planted in the hedgerows, as they are in many other countries, because it induces the children to break the hedges to get at the fruit. But in the neighbourhood of the towns, where fruit can be readily disposed of, every cottage has a little orchard attached to it. The apples, pears, cherries, and plums which it produces help to pay the rent. In some situations walnut-trees grow to a great size, and produce abundant crops, which are always valuable, especially when walnuts are scarce in England, as a considerable exportation of them enhances their price. There is nothing particular in the management of fruit-trees in Flanders. There are not many walled

gardens, except near the houses of the richer proprietors, and in the immediate neighbourhood of large towns, as Ghent and Bruges. Wherever there are old convents, good gardens are generally found, gardening having always been a favourite recreation of the monks in their old age.

A considerable extent of woodland once covered the poorer sandy districts about Thorout, and from thence to Bruges and many other parts of Flanders, of which the soil was formerly not thought worth cultivating. But all these woods gradually disappear as cultivation spreads, and of late years the conversion of woods into arable fields has gone on most rapidly, especially since the coal-mines have been more extensively worked, and the price of wood for firing has diminished. The increase of population and industry will probably soon convert what remains of them into cornfields. The most common trees found in old woods are oak, beech, ash, and birch. The plantations of firs are mostly of modern origin, and intended merely as a preparation for the further improvement of the land, as was mentioned before (ch. II., page 21.) They are, consequently, of no size, nor of much use as timber. Where woods are properly attended to, it is the custom to prune the trees, and cut off all the young branches which shoot from the stem, to the height of thirty feet or more. When the shoots are quite young this is done close to the bark, which soon grows over the wound, and the stem has a straight smooth appearance. In this way trees may be left nearer to each other than if their branches spread out; but there is no chance of finding oaks with large limbs, which are so useful for ship-building. In fact, there is scarcely any ship-timber growing in Flanders. The trees are usually cut down at forty or fifty years old, as it is thought, and perhaps correctly, that after that time the growth of an oak does not pay the interest of the price it would have sold for, together with a rent for the land it occupies. The same calculation has caused the white poplar, and other quickly-growing trees, to be preferred to any other for planting in all situations where such trees find sufficient moisture. In the flat and low parts of Flanders, where the water lies very near the surface, and where ditches are necessary to drain the land, as well as to separate fields and properties, the white poplar and the alder are planted on each side of the ditch, generally in the slope, about eighteen inches below the level of the field. These form a fence which is not impervious, and which would be of little use if the cattle were turned out to feed in the

fields, as is the case with us ; but these hedge-rows are a source of considerable profit to the landlord and to the tenant, the former reserving the trees, and the latter having the liberty of cutting the underwood every seven years. This is so general a practice, that the incoming tenant is obliged to pay to the outgoing the value of all the underwood, which has not been cut the last year, according to its growth ; he receiving the same allowance when he quits. This insures the proper care of the fences. The ditches are cleared out as often as there is any deposit of mud sufficient to pay for the expense, which is generally in two or three years. There is no such thing as a raised bank to be seen in all Flanders, except the dykes along the rivers. The earth which is dug out of the ditches is spread over the land on each side, in order to raise it, and where there is any danger of floods in winter the ditches are wide and more numerous, in order to raise the land above the floods. In low places the ditches are so near to each other, that they take up a large portion of the land, which lies in narrow strips between them ; but this is no loss, as the earth raises the land, and lays it dry, besides deepening the soil : and those strips of land drained by the ditches, and by the trees planted along them, which suck up a great portion of the superfluous moisture, are in general very productive. Where the land lies high and dry no ditches or hedge-rows are to be seen ; the fields and properties are only distinguished by land-marks, and the whole has the appearance of a common field, although no right of common pasture exists over them, except such as is voluntarily given to the common flock of sheep, or to the sheep of the person who keeps a bull and a ram for the use of the parish, as was mentioned before (page 94.)

Fences and ditches, where they are not necessary to carry off the water, are considered as taking up ground which may be more profitably cultivated. This is a general notion on the continent, contrary to our invariable practice of enclosing with a hedge and ditch. Fences and hedges are not only useful to protect the crops from the inroad of cattle or trespassers, but they break the force of the winds, and often prevent the storms from laying the corn. In cold springs also they intercept the sharp, cold winds, and prevent them from nipping the young blade in its tender state. If they intercept the rays of the sun in summer, they do so in a very trifling degree : and, provided there are no high trees in the fences, a neat low hedge will have little effect in retarding the maturity of the crop. Trees in hedge-rows, except

poplars, willows, and alders, planted along the ditches for the purpose of drawing up and evaporating the moisture, as is the case in Flanders, although they may occasionally be profitable to a landlord whose tenants have not made a sufficient deduction from the rent on this account, are always dearly paid for by the injury which they do to the adjoining land. If a portion of the best land were converted into a wood, and well managed, it would repay the landlord better, in the end, than all the straggling trees, which spoil the fences, and diminish the annual produce of the land. We are not taking the appearance of a country into the account. The beauty of an English landscape would be much lessened, if the hedge-rows were not furnished with trees, but we are treating of the interest of the farmer, and not of the man of taste or the artist.

Coppice wood is cut every seven, eight, or nine years. A certain number of the strongest stems are left to grow to poles and trees, as is most profitable. In moist situations alders and willows form the principal underwood. Beech, ash, and oak grow in the higher and drier spots. Neither woods nor coppices are thought very profitable, and they are converted into arable fields as soon as there is a demand for land in the neighbourhood.

CHAPTER XVI.

OF THE SPADE HUSBANDRY PRACTISED IN THE SMALL FARMS IN FLANDERS.

The husbandry of the whole of the north-eastern part of East Flanders, where the soil is a good sandy loam, may be considered as a mixed cultivation, partly by the plough, and partly by the spade. Without the spade it would be impossible to give that finish to the land, after it is sown, which makes it appear so like a garden, and which is the chief cause of the more certain vegetation of the seed. There is a great saving of seed by this practice, as may be seen by comparing the quantity usually sown in Flanders with that which is required in other countries where the spade is more sparingly used. In large farms in England the spade is only used to dig out water-furrows, and to turn heaps of earth, which are made into composts with different kinds of manure. But in Flanders, where the land is usually laid in

stitches of about six or seven feet wide, the intervals, as we observed before, are always dug out with the spade, and the earth spread evenly (*sifted*, as they call it,) over the seed which has been harrowed in. The earth may not be of a fertile nature below the immediate surface; sometimes it is only a poor sand, or a hard till, but this is no reason why it should not be dug out. If it is very light and poor, a good soaking with urine, a few days before it is dug out, will impart sufficient fertility to it. If it is very stiff, the clods must be broken as small as possible in the digging, as is done when stiff ground is trenched in gardens; and what is left unbroken on the surface, and not pulverized by the passing the *traineau* over it, will inevitably be reduced to a powder by the frost in winter. Thus the land is not only kept perfectly drained, but the seed, being covered by an inch or more of earth, is placed out of the reach of birds, without danger of being buried too deep. The soil from the bottom of the trench contains few seeds of weeds, and the root-weeds are necessarily cleaned out in the spreading. This earth spread over the surface of the land keeps it clean by burying the smaller seeds which the harrows may have brought to the surface, and preventing their vegetating. It is for this reason that the roller, or the *traineau*, is made to press the surface; or that, in very light soils, men and women tread it regularly with their feet, as gardeners do after they have sown their beds. The trench, which is thus dug, is a foot wide, or, more properly, one-sixth part of the width of the stitch or bed; and the depth is from a foot to eighteen inches, according to the soil. Thus a layer of earth about two inches deep, at least, is thrown over the seed, which has been sown on a surface made even by the small harrows, or the bush-harrow. These two inches gradually incorporate with the soil below, and thus, at every such operation, the soil is deepened so much.

The trenches are so arranged that every year a fresh portion of the ground is dug out, and in six years the whole land will have been dug out to the depth of at least one foot. In the next course the trench is dug a few inches deeper, which brings up a little of the subsoil; and, after four or five such courses of trenching, the whole soil comes to be of a uniform quality to the depth of eighteen or twenty inches, a most important circumstance to the growth of flax, potatoes, and carrots, all of which are very profitable crops to the farmer, and the two last indispensable to the maintenance of the labourers and the cattle. In the Waes country they proceed

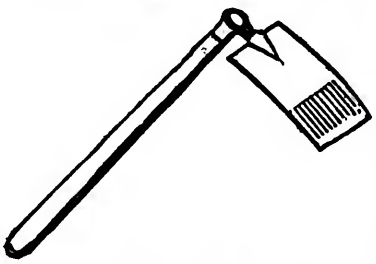
differently, for they have a soil which, by repeated trenchings, has long been uniform in quality to the required depth. There they regularly trench one-sixth part of the land every year, and plant it with potatoes, or sow carrots in it. This comes to the same thing in the end, and is, perhaps, a saving, from the fixed price of trenching, and the expertness of the labourers in this operation. But where the land has not yet been so completely deepened, the first may be the most easy method of producing the thorough mixture of the different parts of the soil; besides, it is only done on that part of the farm which is sown with corn, or about half of the arable land; so that it is only the twelfth part of the farm which is thus dug up. There is no doubt that this operation might be done at a less expense of labour by the application of improved implements: thus a small plough, with one horse, might draw two small furrows, laying the earth into the middle of the divisions between the stitches. This earth might be shovelled out, and thrown on the beds on each side: a second bout of the plough would give the required depth. We would suggest this as an experiment to all occupiers of wet soils, especially where the land has been lately drained. The effect of it would be perceived in a short time, and would perfect the improvement produced by judicious and deep draining, and the use of the subsoil plough. The great point is the expense. It is impossible to calculate exactly what additions this would make to the expense of an acre of land at the time of sowing. At first the price would be much too high, but, as labourers become better acquainted with it, and more expert, there is no doubt but it could be done at a price which would bear the same proportion to the price of corn with us as it does to the Flemish farmer; and, with our ingenuity in performing operations by instruments and machines, which supersede much of the manual labour otherwise required, it might be found not only highly advantageous to the crops, but also highly economical. A bushel and a-half of wheat is an ample allowance to sow an acre, where every grain is protected, and nine out of ten are likely to grow, if the seed has been carefully selected. This of itself is a sufficient saving, but the crop will be more certain in a deep dry soil, whatever be the season: and the gradual and permanent improvement of the soil must not be lost sight of. Might it not be judicious in the landlords to make some allowance to those tenants who hold their farms for a short term, if they would adopt this plan, which would be far more effectual than a partial under-

draining, which often produces but a very trifling or temporary effect? The landlord will always find that he reaps the principal advantage, in the end, of any method which permanently improves his land. But even the tenant, if he has a lease, of which a few years remain unexpired, will derive a certain profit from this operation, after the first year or two, and this may induce him to try it even without encouragement from the landlord. Let him make the experiment upon a single acre first—the loss cannot be great. Let him keep an exact account of the extra labour and extra produce, as compared with an acre cultivated in the usual way, and the result must be satisfactory one way or other. If this experiment be made in several places, it will at once decide the question whether this addition to the manual labour of the farm is repaid by the increased produce or not: if it should only balance, without immediate gain, there would be a great advantage in the practice: there would be more employment for men out of doors, and threshing machines and other instruments to diminish labour would not be looked upon with a jealous eye, as depriving the poor man of his bread. Supposing an acre, the length of which is one hundred yards, and the width consequently forty-eight yards and a fraction, divided into twenty stitches, which will make each stitch a little more than seven feet, including the interval, there will be two thousand yards in length to dig out and spread on each side. This, at a penny for twenty yards, would cost only eight shillings and fourpence; and we think it might be done for less, if previously loosened with a plough. The saving of one bushel of seed at seven shillings, the present price (1837,) would nearly pay the expense; but suppose the expense to be the double of this, the advantage to the land at the end of a few years would amply repay it. At first it is not likely that the effect would be very striking in the superiority of the crops, but a gradual improvement would be visible, especially in the clover, which strikes its roots deep, and cannot bear a wet or a hard bottom. Heavy lands may thus be made to bear excellent turnips, and admit of folding sheep, while similar lands, not so treated, would not be fit for this root, nor be advantageously folded over, in consequence of the moisture remaining nearer to the surface.

Another application of the spade, in the Flemish cultivation of land, is the deepening of the furrows, by taking out solid spits of the bottom soil in autumn, and placing them on the ploughed part of the land. This, which has been noticed before as a practice

peculiarly Flemish, tends to lighten the whole soil, to mix a portion of the subsoil with it, and gradually deepen it. The spit which is taken out is left to crumble by the influence of the atmosphere, and in winter or in spring the clods are broken and spread by the harrows, and mix with the surface. This operation can only be useful in light loams and sands, for it is evident that in clay the holes thus made, and but loosely filled up, would form basins for the water to collect in, and do more harm than the earth brought to the surface could do good. But the principle is the same, which is to increase the depth of good soil gradually. We would give the preference to the first method, unless where the tenure did not permit the farmer to wait a few years to reap the full benefit of the operation. The last described is the more immediate in its effects, the former the more perfect and durable.

Instead of the spade an instrument is also much used, which may be considered as intermediate between it and the hoe. It is the *hack*, or heavy hoe, which is used for loosening the soil to a small depth, in order to clear it of root-weeds and annuals, which may have shed their seed before the crop was reaped. It has a blade like a small spade, fixed to a handle three or four feet long, at an angle of about 60 degrees (see fig.) With this instrument the stubbles are cleared, the weeds are cut up, and the land, thus stirred, is prepared by raking and harrowing only, for sowing turnips or any other crop sown immediately after harvest. The depth thus cultivated is only two or three inches, but the ground is gone over rapidly, and at a less expense than it could be done with a plough at the busy time of harvest. The work is not too heavy for women and boys, who are often seen employed in it: whereas it is very unusual to see a woman at work with a common spade. The same instrument is also used for drawing the earth round the roots of potatoes or of colza, which are seldom moulded up with the plough.



Where the land is cultivated entirely by the spade, and no horses are kept, a cow is kept for every three acres of land, and entirely fed on artificial grasses and roots. This mode of cultivation is principally adopted in the Waes district, where properties

are very small. All the labour is done by the different members of the family; and children, instead of being a burden, soon begin to assist in various minute operations, according to their age and strength, such as weeding, hoeing, feeding the cows. If they can raise rye and wheat enough to make their bread, and potatoes, turnips, carrots, and clover, for the cows, they do well; and the produce of the sale of their rape-seed, their flax, their hemp, and their butter, after deducting the expense of manure purchased, which is always considerable, gives them a very good profit. Supposing the whole extent of the land to be six acres, which is not an uncommon occupation, and which one man can manage. One acre is trenched twenty inches deep every year, well manured with the dung and urine of the cows, and planted with potatoes, part of an early kind and part of a later, as the land is ready, from the beginning of April to the end of May. If the soil is fit for wheat, this is usually the next crop; if it is too sandy, rye is sown instead. The taking up the potatoes gives a sufficient tillage for the wheat or rye, which is sown as soon as the potatoes are off, and the seed is covered by digging narrow trenches at six or seven feet distance from each other, and throwing the earth evenly over the seed. The land is rolled, or trodden with the feet, which last is best in light soils. Half an acre of land is usually in carrots, which have either been sown with the flax, or, which is much better, by themselves. The turnips are always sown on a stubble. The land which has borne rye is generally preferred for this purpose, as it is the first crop reaped. They may also be sown with advantage after early potatoes, or after colza. Sometimes oats are sown immediately after harvest, to be cut up green for the cows before winter, or winter barley to cut early in spring. Spurrey is sown for the same purpose, but it is so apt to infest the ground as a weed, that it is only in the very sandy soils that it is much cultivated. Buckwheat is sown when there is no manure to spare, in order to fatten a couple of hogs for the winter's provision.

The rotations of crops, followed by the small spade farmers, vary extremely, according to the soil, situation, and other circumstances. Hemp, flax, and colza, seldom recur in less than nine or ten years, as they require much manure, and do not succeed if sown too often. Wheat usually occupies a-fourth, or a-third of the land, rye a-sixth, potatoes a-sixth, clover an-eighth: carrots and turnips are mostly secondary crops, although occasionally sown also as principal crops. The successions are generally as follows:—

In good loam. Wheat after clover, potatoes, or beans.
Rye and turnips after wheat or potatoes.
Oats after turnips or carrots.
Potatoes after turnips, clover, or buckwheat.
Flax after hemp, potatoes, or carrots.
Hemp after turnips.
Colza after flax.
Beans after wheat or clover.
Turnips after rye, barley, or oats, the same year.
Carrots in the rye or the flax, or after clover.
Clover in flax, oats, or wheat.
Winter barley, to cut green in spring, after potatoes.

When any other produce is raised, such as peas, tares, poppies, cameline, beet-root, or parsnips, they only take the place of those crops which are most nearly allied to them, whether pulse, oily seeds, or roots, without altering the succession.

The first object of the spade farmer is to procure food for his cows, for without them he cannot have manure enough. He must not merely have a bare sufficiency for them, but he must have abundance, for, if the food of the cows fails, his whole process is impeded: he must then either sell some of his stock, or buy fodder at a ruinous expense. If he has too much, he will never be at a loss how to dispose of it. He must also have food for himself and his family. It is calculated that each grown individual consumes in the year—

6 bushels of rye
3 ditto wheat
3 ditto buckwheat
} or 12 bushels of grain.
14 ditto potatoes.
48 lbs. of butter.
1 cwt. of pork.
And 2 quarts of butter-milk, or skim-milk, per day.

If a man with his wife and three young children are considered as equal to three and a-half grown-up men, the family will require thirty-nine bushels of grain, forty-nine bushels of potatoes, a fat hog, and the butter and milk of one cow: an acre and a-half of land will produce the grain and potatoes, and allow some corn to finish the fattening of the hog, which has the extra butter-milk; another acre in clover, carrots, and potatoes, together with the stubble turnips, will more than feed the cow; consequently two and a-half

acres of land is sufficient to feed this family, and the produce of the other three and a-half may be sold to pay the rent or the interest of purchase money, wear and tear of implements, extra manure, and clothes for the family. But these acres are the most profitable on the farm, for the hemp, flax, and colza are included; and, by having another acre in clover and roots, a second cow can be kept, and its produce sold. We have, therefore, a solution of the problem how a family can live and thrive on six acres of moderate land. We must next consider how the land is to be tilled by them without any hiring of labour. A good labourer can trench four perches of land, each perch being the square of five and a-half yards, in a day, or dig eight perches. It will take him thirty days to trench an acre, and sixteen to dig it well. It will take him, therefore, seventy-eight days' labour to trench one and dig three more acres; one being in clover does not require it, and that which had potatoes before is prepared by digging them up. His wife and children carry the clover which he cuts after his day's work, and weed the crops. The digging for wheat and rye is done in the autumn, beginning with the land cleared of colza; the hacking the stubble for turnips, and sowing them makes a variety in the toil, this not being so laborious. The trenching is done in winter and at any spare time between harvest and spring. The wheeling of manure, harrowing, sowing, digging out water-furrows, and reaping the corn on three acres, will take forty-five days' labour. An acre of potatoes on the trenched ground will require twenty-four days' work to make ridges, plant the sets, mould them up with the hoe, and take them up. The turnips after rye will require eight days to hack the stubble, harrow it, and sow the seed, and four days, with the help of the family, to pull them and wheel them to the root-cellar, for they are never left in the field in winter. Allowing five days for cutting the clover, and making a portion of it into hay, we have found work for one hundred and sixty-four days, which, to include various smaller operations, we shall reckon altogether two hundred days' work out of doors. The remainder is amply sufficient to thrash out the produce, prepare manure, assist his wife and children in feeding the cows and pigs, and weave occasionally. The flax, being generally sold standing, and pulled by the buyer in summer, does not interfere with the farmer's labour. The weeding in spring is done by the whole family, and neighbours mutually assist each other.

In a farm of ten acres entirely cultivated by the spade, the addition of a man and a woman to the members of the family will render all the operations more easy; and with a horse and cart to carry out the manure, and bring home the produce, and occasionally draw the harrows, fifteen acres may be very well cultivated. Mr. De Lichterfelde has given a calculation of the expense of cultivating such a farm, and the average produce, which, as being on good authority, we shall subjoin with some remarks. The cultivation here is supposed to be carried on by hired labour :—

TABLE of EXPENSES and PRODUCE in the Cultivation of 15 Acres of Land by the Spade, with a Horse to carry Manure and Produce.

REMARKS.—The florin (fl) is 20 sols (s); the sol 4 liards (l).—The sack is nearly 3 bushels imp. meas.—14 florins make £1 sterling.—A pinte (pt) is nearly an English quarter-peck.

No. of Acres.	ROTATION. 1	2	3	4	Average Produce.	Aver. Value.	Total value in Florins.	Number of days' labour. Men. At 14 sols Brabant.	Men. At 13 sols.	Women. At 10 sols.	Manure. Cart-loads of Dung, at 6 fl.	Casks of Liquid, at 12 sol.	Measures of Ashes, at 12 sol.	Seed.	Total value in Brabant money.
1	Oats.	Clover.	Colza and Potatoes.	Wheat.	30 sacks 9000 lbs. of Straw.	9fl per sack 1 liard per lb.	332 10	93¼	30	48	.....	90	.....	¼ sack	fl 169 17 6
1	Oats.	Clover.	Colza and Potatoes.	Wheat.											
1	Rye and Turnips.	Carrots.	Flax.	Wheat.											
1	Clover.	Colza and Potatoes.	Wheat.	Rye and Turnips.	30 sacks 12000 lbs. of Straw.	5fl. 1 liard.	300 0	93¼	30	30	.....	90	.....	¼ sack	155 0 0
1	Clover.	Colza and Potatoes.	Wheat.	Rye and Turnips.											
1	Carrots.	Flax.	Wheat.	Rye and Barley.											
1	Flax.	Wheat.	Rye and Turnips.	Buck Wheat.	10 sacks 2000 lbs. Straw	5fl. ¼ liard	56 5	30½	.....	12	.....	.....	.....	4 pts. at 3s. 3l.	28 5 6
1	Colza and Potatoes.	Wheat.	Rye and Turnips.	Oats.	40 sacks 6000 lbs. of Straw.	4fl. ¼ liard	197 10	63½	20	20	16	.....	.....	1¼ sack	169 9 0
1	Wheat.	Rye and Barley.	Buck Wheat.	Oats.											
1	Wheat.	Rye and Turnips.	Carrots.	Flax.	Sold standing.	.....	210 0	31	.....	80	.....	30	.....	30 pts. at fl 1 10	124 14 0
1	Buck Wheat.	Oats.	Clover.	Colza and Potatoes.	20 sacks Straw, at	20fl. 12fl.	424 0	104	.....	30½	8	60	.....	4 pts. at 15s.	175 1 0
1	Rye and Turnips.	Oats.	Clover.	Colza and Potatoes.											
1	Colza and Potatoes.	Wheat.	Rye and Turnips.	Carrots.	value per po rch, 6d		90 0	30½	.....	10	8	.....	.....	1¼ pt. at 2 1	79 0 6
1	Rye and Turnips.	Buck Wheat.	Oats.	Clover.	value per po rch, 8d		240 0	16½	.....	.....	.....	.....	60	3 pts. at fl 2 10	47 11 0
1	Wheat.	Rye and Turnips.	Oats.	Clover.											
15	SECOND CROPS.														
	2 acres Turnips valued						120 0	54½	.....	16	.....	.....	.....	1¼ pt. at fl 1	47 13 0
	1 do. Barley, cut green, valued						75 0	28½	.....	.....	8	.....	.....	¼ sack at fl 5	70 5 6
	2 do. Potatoes				200 sacks	fl 1 5	250 0	89½	.....	12	12	60	.....	3 sacks fl 1 5	150 8 0
	5 acres						2845 5	685½	80	264½	32	330	60		fl 1246 5 0

DISTRIBUTION of the LABOUR on the FOREGOING FARM, per Acre.

WHEAT AFTER POTATOES OR FLAX, OR RYE AFTER WHEAT.

	Day's Work. Men.	Women
Digging and forming beds	20	0
Carrying liquid manure, and spreading	1	0
Sowing the seed	0¼	0
Harrowing in	2	0
Digging out the intervals, and spreading the earth over the seed	2½	0
Treading in the seed	0	6
In Spring.		
Weeding	0	8
Harvest.		
Reaping	2½	0
Tying the sheaves	0	2
Loading	1	0
Stacking	2	0
Total	31¼	16

BUCKWHEAT AFTER BARLEY, CUT GREEN.

Digging, sowing, harrowing	22½	0
Weeding	0	8
Mowing	2	0
Gathering and carrying to thrashers	0	4
Thrashing in the field	3	0
Cleaning, winnowing	1	0
Loading and carrying straw	1	0
Stacking	1	0
Total	30½	12

OATS AFTER TURNIPS.

Carrying 8 loads of dung	1	0
Spreading	1	0
Digging, harrowing, and sowing	22½	0
Rolling	2	0
Weeding	0	8
Harvesting as for wheat	5½	2
Total	31¾	10

OATS AFTER BUCKWHEAT.

Same as the preceding	31¾	10
Digging the intervals, and spreading the earth over the beds	2½	0
Total	34¼	10

FLAX AFTER CARROTS.

Before Winter.		
Digging out spits of earth from the intervals, and placing them on the beds	2½	0
In Spring.		
Spreading	1	0
Digging	20	0
Carried forward	23½	0

	Day's Work Men.	Women
Brought forward,	23½	0
Carrying liquid manure	1	0
Harrowing repeatedly	2	0
Sowing	0½	0
Bush-harrowing the seed	2	0
Rolling	2	0
Weeding	0	80
Total	30½	80

Colza after Clover or Potatoes.

Before Winter.

Preparing a bed to raise plants	0½	0½
Carrying 4 loads of dung	0½	0
Spreading	0½	0
Deep trenching	30	0
Taking up young plants, and making holes for planting	4	0
Putting the plants in the holes, and treading the earth to them	0	4
Digging spits out of the intervals, and placing them between the plants	3½	0

In March.

Carrying liquid manure	1	0
Weeding	0	8

Harvest.

Cutting the stems	4	0
Carrying them to the thrashers in the field	0	2
Thrashing	5	0
Cleaning	1	0
Tying up the straw	0	1
Loading and stacking	3	0
Total	53	15½

Carrots after Turnips.

Digging, harrowing, and sowing, as for oats	22¼	0
Spreading earth over the seed	2½	0
Weeding	0	8
Taking up the crop	4	0
Collecting and cutting tops	0	8
Securing them in pits with straw and earth over them	2	0
Total	30¾	16

Clover.

Sowing amongst the oats or wheat	0½	0
Spreading ashes after harvest	1	0
Mowing twice next year	5	0
Tying up in bundles, and carting	2	0
Total	8½	0

Turnips after Rye.

	Day's Work. Men.	Women.
Digging, sowing, and harrowing	22¼	0
Weeding and thinning out	0	8
Pulling and carting	5	0
Total	27¼	8

Winter Barley after Rye, to cut green.

Before Winter.

Digging	20	0
Carrying 8 loads of dung	1	0
Spreading dung	1	0
Sowing	0¼	0
Spreading earth out of intervals over the seed	2½	0

In Spring.

Cutting and carrying	3½	0
Total	28¼	0

Potatoes after Colza or Barley, cut green.

Digging and drawing furrows with the large hoe	30	0
Carrying six loads of dung	0¾	0
Spreading dung in the furrows	2	0
Cutting the sets	0	1
Placing them in the furrows, and covering them	2	2

When they are up.

Carrying liquid manure	1	0
Pouring it to the plants	2	0
Hoeing and moulding up	3	0

In Autumn.

Forking up the Potatoes	3	0
Gathering them	0	3
Loading and carrying	1	0
Total	44¾	6

Recapitulation.

For wheat or rye	31¼	16
Buckwheat after barley, cut green	30½	12
Oats after turnips	31¾	10
Oats after buckwheat	34¼	10
Flax after carrots	30¾	80
Colza after clover	53	15½
Carrots after turnips	30¾	16
Clover	8¼	0
Turnips after rye	27¼	8
Winter barley after rye	28¼	0
Potatoes after winter barley, cut green, or colza	44¾	6

The total value of the produce is here stated at 2345fl. 5s., which, at 14 florins per £., is 167*l.* 10*s.*, or 11*l.* 10*s.* per acre. Wheat is worth in Flanders on an average 35*s.* per quarter, and a

man's daily wages are 10*d.*, without food, in summer, and 9*d.* in winter. We have given the table without alterations, although we are aware that it appears imperfect; for although the keep of a horse is mentioned, it is not included in the expenditure. The straw, green crops, and roots, are valued, no doubt, after minute calculations, but it does not appear whether the produce of the stock is only equivalent to the food consumed, or gives a profit,—a matter of great importance. To correct this we will make another calculation on the same basis; and, to make it more intelligible to the English reader, we will put the prices as they are now in English money. The 29,000 lbs. of straw will produce, at 500 lbs. of straw for a cart-load of dung, fifty-eight cart-loads; four cows and a heifer constantly kept in the stable will give, with the washings of the stables, at least twenty gallons of liquid manure daily, that is, three hundred and sixty-five casks of twenty gallons each in the year. Thus the manure is accounted for, and if any is purchased it may be expected to be at least repaid by the increase of produce above the stated average. The crops raised chiefly for the stock should be valued by the produce of that stock, and we will show that it is fully sufficient for the purpose. Two acres of clover contain three hundred and twenty perches, which are cut twice. Each cow will consume half a perch a day of the first cut, and two-thirds of a perch of the second cut, that is, fifteen perches per month of the first, and twenty of the second. The two acres will, therefore, keep six beasts, including the horse, who eats less than a cow, three months and a-half, and the second cut two months and a-half more, if no hay is made; but if an acre of the first cut is made into hay, and an acre of barley cut green is given early in summer in its place, there will be two tons of hay for winter fodder. Two acres will produce at least fifteen tons of potatoes, two acres of turnips will average about ten tons each, although sown after harvest, and one acre of carrots fifteen tons. If a cow consumes 40 lbs. of turnips, and 20 lbs. of potatoes, and the same quantity of carrots per day, made into a *brassin*, she will require in six months, or one hundred and eighty-three days, 7320 lbs. of turnips, 3660 lbs. of carrots, and 3660 lbs. of potatoes: and five cows will consume 36,600 lbs. (nearly 16 tons 7 cwt.) of turnips, 18,300 lbs. (8 tons 3½ cwt.) of carrots, and 18,300 lbs. (8 tons 3½ cwt.) of potatoes. It appears, therefore, that there is ample provision for the cows kept, with a considerable surplus for the pigs. The horse will have two tons of clover-hay and a little corn occa-

sionally, not exceeding twenty bushels in the whole year, which must be deducted from the produce of the oats. This calculation is made merely as a proof that the quantity of food raised for the cattle is more than sufficient for their maintenance. The common mode of calculation in Flanders is by the *verge*, of which there are three hundred in a Ghent acre, which is about one-ninth greater than the statute acre. It is this acre which the table refers to. A verge of clover, carrots, or turnips, is considered sufficient for a day's food for a cow. An acre will, therefore, keep her three hundred days, and, as we have one acre of clover, and one acre of barley cut green, two acres of turnips, and one of carrots, the produce will keep five cows three hundred days; so that there will be required as many potatoes as will keep five cows sixty-five days, which, at half a bushel per day for each cow, will be one hundred and sixty-two bushels and a-half, a quantity which, in good land, may be raised on half an acre. This mode of calculation gives so nearly the same result as the former, that they confirm each other.

It is evident, then, that fifteen Ghent acres of light land of moderate quality may be kept in good condition by the foregoing plan of cultivation by the spade, with the help of a horse and cart, and will maintain four milch cows and a heifer, a horse, two or three pigs, and a couple of young calves, sending to market, or consuming in the family the following produce, deducting seed :—

90 bushels of wheat, at 7s.	£31	10	0
90 bushels of rye, at 4s. 3d.	19	2	6
30 bushels of buckwheat, at 4s.	6	0	0
100 bushels of oats, at 3s. (leaving 20 bushels for the horse)	15	0	0
An acre of flax, supposed worth	20	0	0
60 bushels of rape-seed, at 6s.	18	0	0
8 cwt. of butter from four cows, at 5*l.* per cwt.	40	0	0
Two fat hogs, at 7*l.*	14	0	0
A heifer and two calves sold annually	8	0	0
	£171	12	6

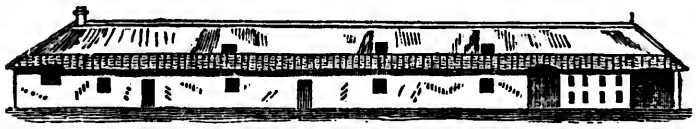
The expenses on the farm, reckoning labour at the rate paid for it in the dearest parts of England, will be as follows, according to the table of labour :—

635 days of men in summer, at 2s.	£63	10	0
80 ditto in winter, at 20d. (thrashing)	6	13	4
264 ditto of women, at 10d.	11	0	0
180 bushels of peat-ashes, at 4d.	3	0	0

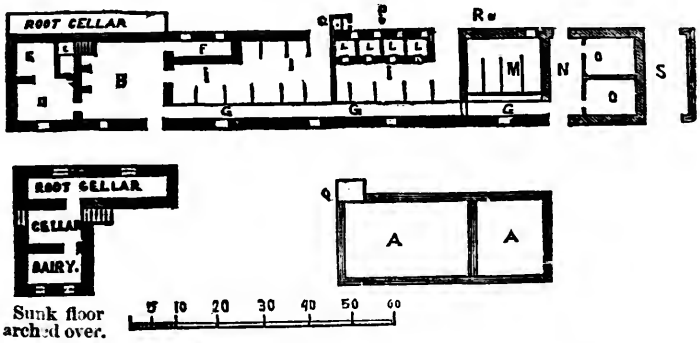
200 rape-cakes for the flax, at 2d. (£6 a-ton).....	1	13	4
Extra expense in harvest, beer, &c.....	2	3	4
	£88	0	0
Remains for rent, interest of capital, profit, &c.....	83	12	6
	£171	12	6

The buildings required for such a farm are not expensive. The dwelling-house generally consists of a large kitchen and two bed-rooms, of a dairy, partly under ground, and a cellar for keeping roots in winter. The barn and cow-house are often placed at right angles to the dwelling-house, and, with some open sheds, enclose a yard. But the cheapest plan is that given in the annexed figure, where the whole is under one roof. The urine-tank is the most essential part, and will appear very large for so small a farm.

Front Elevation.



Ground Plan.



A A, urine tank, under the stable and cow-house, 50 feet by 20, and 6 deep, with a partition in it.
B, kitchen.
D and E are sleeping-rooms raised a few feet above the kitchen, and over the dairy and cellar.
F, a work-shop for weaving and other work.
G, passage to feed the cattle.
I I, cow-house.
L L, pig-styes.
M, stable,
N, barn floor.
O O, bays.
P, pump for urine.
Q, privy.
R, pump for water.
S, cart shed.

Thus it will be seen that, by spade husbandry, an industrious man, with a small capital, occupying only fifteen acres of good light land, may not only live and bring up a family, paying a good rent, but may accumulate a considerable sum in the course of his life. The Flemish farmers and labourers live much more

economically than the same class in England: they seldom eat meat, except on Sundays and in harvest; buttermilk and potatoes with brown bread is their daily food. Accordingly they are gradually acquiring capital, and their great ambition is to have land of their own. They eagerly seize every opportunity of purchasing a small farm, and the price is so raised by the competition, that land pays little more than two per cent. interest for the purchase-money. Large properties gradually disappear, and are divided into small portions, which sell at a high rate. But the wealth and industry of the population is continually increasing, being rather diffused through the masses, than accumulated in individuals. An Englishman with a capital of 100*l.* might cultivate such a farm advantageously, and if he is satisfied to live as a labouring man would have the same advantages as the Fleming. His own labour is valued at twelve shillings a-week, his wife's at five shillings, and if she is not always at work his children make up for it. The rent of fifteen acres of land, with a house, cow-house, and small barn, could not be less than 40*l.* a-year, tithe free; and rates and taxes may amount to 5*l.* more; still he would have 38*l.* 12*s.* 6*d.* for his risk, capital, and superintendence, or about one-fifth of the gross produce, which is as much as a farmer on a larger scale could expect, without being paid for his personal labour. In Ireland where there are many farms of less than fifteen acres, the Flemish system would soon raise the class of small farmers to competence, if they would only expend the money which now pays for whiskey in forming a urine-tank, and raise artificial grasses and roots for their cows and pigs, instead of trusting to potatoes alone, and over-cropping the land with them. There is some resemblance in the principles of Irish and Flemish cultivation with the spade. The lazy beds for potatoes have the intervals dug out and spread over the beds. The Irish are accustomed to dig and trench ground; they already can live on buttermilk and potatoes; and the cultivation of flax is familiar to many of them. Give them but a taste for cleanliness and comfort in their habitations, and decency in their dress, and they will soon emulate the Flemish peasant in his industry and independence.

The foregoing account of the spade husbandry of Flanders has been obtained by inspecting many small farms, and comparing the practice of the occupiers. The calculations of produce and expenses are partly taken from a Report made to the French Government, in 1812, by M. de Lichtervelde, then adjoint-maire of Ghent

in answer to questions sent to him respecting the agriculture of East Flanders, which then formed a department of France, and partly from a small work of his, published in 1826, called "La Beche, ou la Mine d'Or de la Flandre Orientale." It is always extremely difficult to calculate the labor on a farm, so as not to fall short of, nor exceed, what is absolutely necessary. The amount of produce and profit may be nearly averaged from actual accounts, but the effect of additional manure or improved tillage cannot always be reckoned. The quantity of produce stated in the table is certainly not extraordinary, being the same as is produced on a farm cultivated with the plough; and if it were not that the land where the spade husbandry has been chiefly introduced is mostly of a poor sandy nature, we should say that it was below the average. In better land, such as in the good loams near Courtray, the spade would produce much more wonderful effects, and the heavier the soil, provided it be of a friable nature, the better fitted it is to be cultivated by the spade. Many an acre of land in Britain and Ireland, which now only bears indifferent grass, might be rendered most productive by being converted into a garden by the spade.

CHAPTER XVII.

AN ACCOUNT OF SOME SELECT FARMS.

The details of Flemish Husbandry cannot be better explained than by reference to a few of the best cultivated farms in different parts of the country. There is a great uniformity in the general practice, but there are considerable variations introduced, in consequence of the diversity of soil and situation. One of the first farms we shall notice is situated within a mile of Courtray, and is in the occupation of a man who has more theoretical knowledge of agriculture than most other Flemish farmers: he is a native of France, but has passed a great part of his life in Flanders; and his wife, who seems very active and well acquainted with the details of a farm, especially the dairy, is a Flemish woman. The place where the farm is situated is called Walle. The extent is thirty-six bonniers, each bonnier being about three acres. The soil is a good sound loam, which, although it is there called a strong soil, would not be reckoned very heavy in those counties

in England where the clay prevails. It is such land as may be seen in some parts of Essex and Hertfordshire, which will produce good beans without being too heavy for turnips, or even carrots. The quality of the soil does not vary materially through the farm. It is not of so rich a nature as the clays of the polders, and, when washed, contains a considerable portion of silicious sand; but it has been enriched by repeated and ample manuring, not only by the dung and urine of the cattle kept on the farm, but by purchased manure of every description, especially the sweepings of the streets of Courtray, and the emptying of privies.

The farm-buildings are very conveniently arranged at a small distance from the high road, from which there is an approach by an avenue of trees. The farm-house, which is substantial and convenient, and the stables for the horses, occupy one side of a square or rectangle of sixty yards long by fifty wide. Opposite the house stands a roomy barn, and another occupies two thirds of the west side of the square. The east side is taken up with a cow-house, ox-talls, and other useful buildings. The entrance is by a gate-way with double gates, at the north-east angle of the yard. A paved causeway ten feet wide runs all round the farm-yard, raised about eighteen inches above it. The cow-stalls, barns, &c., are on a level with this cause-way, and the yard slopes gently towards the middle, where there is an oval tank surrounded by a brick wall, which rises two feet above the yard. There is an opening in this wall sufficient to allow a cart to be backed into it; from this opening the bottom slopes to the further end, where it is three feet deep. This is the *croupissoir*, into which all the liquid part of the dung runs, when it is washed by the rain, through openings left in the wall which surrounds it. The urine is collected in another large vaulted reservoir immediately under the cow-house and ox-stalls.

This description applies equally to most of the farm-yards attached to large farms, for one hundred and twenty acres is a large farm in Flanders.

Thirty cows are constantly kept on this farm, and six horses, besides young heifers and colts. The cows are always kept in the stalls, and fed with green food in summer, and roots with meal in winter. Each cow has a stall in which she is tied up by herself, separated from the next by a large flat slab of stone about four feet square set on edge. There is a low stone trough before her, and an opening in the wall to give her air. She is tied by a leather

strap round her neck, with a chain fastened to a staple, which goes through the wall, and is secured by a nut and screw on the other side. The cow-stable is forty yards long without any division, and six yards wide, so that there is much room behind the cows. In the middle, against the wall, is a pump to supply water for the cows, and to wash out the stable, which is very frequently done, the whole being swept into the urine-tank below through an an aperture, towards which all the gutters slope from the cow-stalls. Under the pump is a stone cistern which is constantly kept full, that the water may acquire the temperature of the air. In this cistern bean or rye meal is mixed, in the proportion of a large double hand-ful to three gallons of water, so that the cows never drink the water without this addition. It is supposed to increase their milk, and make it richer. Outside of the building is the pump by which the urine is raised to fill the casks in which it is conveyed to the land. Another pump is in the centre tank, by which the dung water is raised, either to mix with the urine when rape-cakes have been dissolved in it, or to pour it over the solid dung to accelerate the putrefaction. The pens for fattening calves, as described (page 93,) are placed along the wall behind the cows, and being only two feet wide, take up very little room; there are only two or three of these, for, so near a considerable town, the fatting of calves is not so profitable as selling fresh butter.

A few acres of grass are kept in permanent pasture near the house, and the cows are put there for a few hours every day in summer, more for exercise and for the sake of their health than for grazing. All the rest of the land is arable, and cultivated very strictly according to a regular rotation. Mr. Doutreluinge, the occupier, informed us that he had several times made experiments by varying the usual course; at one time increasing the quantity of flax, and at another that of colza: but he found, by keeping very exact accounts of the expense and produce, that every deviation caused a loss in the end. The rotation is very simple. The whole of the arable land he divides into six parts—one part is half in flax and half in colza, one wheat, one rye and turnips, one oats (five-sixths of which with clover-seed,) one clover, with a small proportion in potatoes and carrots, one two-thirds wheat and one-third beans.

The land intended for flax is ploughed soon after harvest with a very shallow furrow, or only well harrowed to destroy the stuble; rotten dung is spread over it, at the rate of twenty large loads per

acre, about the month of September. It is left spread on the land for some time, and then rolled with a heavy roller: this is to press it into the ground, and make it fine. It is then ploughed in with a shallow furrow. When the plough has made a furrow, six or eight men with spades dig spits of earth out of the bottom of it, which they set upon the part already turned up, so that the ground is partially trenched. The plough on its return fills the holes thus made, and, when the whole is finished, lies in a very rough state, with large clods all over it: so it remains all winter. In spring, when the clods are pulverized by the frost, the harrows pass over repeatedly and level the surface. The land is then ploughed and harrowed several times, till it is thought sufficiently fine. Liquid manure is now put on. This consists chiefly of the emptyings of privies, and the urine of cows, and also of rape-cakes dissolved in urine, and left to ferment for some time, which is done in the open tank in the yard. The quantity of rape-cake used depends on the supply of *vidanges*, which are preferred, the other being only a substitute. This is allowed to soak into the ground for a few days. It is then well harrowed, and the linseed is sown at the rate of about three bushels to the acre, and covered by the harrows reversed, or the traineau. The only peculiarity in this process is the spreading of dung over the land and, letting it remain some time before it is ploughed in. According to the prevailing opinions, we should say that a portion of it must evaporate and be dissipated. But the practice must not be hastily condemned on mere theoretical principles. It is well known that there is no manure so good for flax as that which is collected in the towns by poor people, who sweep the streets, and make composts of everything which is capable of putrefaction. This compost is sold, in a dry state, by measure; and we have repeatedly seen the preparers of this manure spread it out in dry places in the sun to bring it to a marketable state. Probably the origin of this may have been that, by being dry, the carriage of it is lighter; but that the virtue of the compost is not lost by drying appears from the reputation it has amongst the farmers, who piously believe that its extraordinary effects are to be ascribed to a peculiar blessing of God, as it enables the poor and destitute to gain a livelihood. It must be recollected that this manure is so prepared by repeated turning and watering, and that the vegetable fibres in it are almost entirely decomposed. It is probable that in drying nothing is evaporated but simple moisture. This practice being peculiar, and not very generally adopted, renders it more deserving of notice.

A little beyond Courtray along the Lys, towards Menin, is a farm particularly noticed by Mr. Radcliffe in his report of the Husbandry of Flanders. It was then in the occupation of a Mr. Van Bogeart, who afterwards retired with a competent fortune, chiefly acquired by farming. It is now occupied by Mr. De Brabanter, who cultivates it very carefully, with some slight deviations from the practice of his predecessor. This farm is called Vollander, and is one of the finest and most compact we have seen. It consists of about one hundred and forty acres, of which about twenty are fine meadows along the river, occasionally flooded in winter, but not irrigated; about ten acres are rich heavy land, adjoining the meadows, in which beans and wheat thrive well; all the remainder, about one hundred and six acres, or rather more, lie in an oblong field bounded by a hedge-row, at one corner of which, nearest the river, stand the farm-buildings. A road or path, six feet wide, runs through the middle of the field, and the road which leads to the farm-yard skirts one end of it. The soil of this field is a rich light loam, which lies over a substratum of clay, but at such a depth as to be perfectly sound and dry. It is not extremely fertile in its own nature, but has been rendered so by many years of an improving husbandry. Every part of the land has been repeatedly trenched and stirred two or three feet deep; and the immense quantity of manure, chiefly liquid, put on year after year, has converted the whole into a very rich mould. The strength and vigour of the crops bear witness to the goodness of the husbandry. As we walked along the middle path, which is just wide enough to admit the wheels of a cart, the whole produce might be seen at once. It was just the time when the flax had been pulled, and remained stacked on the ground. The colza had been beat out, but the stems remained in heaps where they had been cut. There were fifteen acres of most beautiful flax of a bright straw-colour, and the stems a yard long. This, besides the seed, was worth in the stack from 25*l.* to 30*l.* per acre; twelve acres of colza had produced about fifty quarters of seed; eighteen acres of oats looked so promising that they could not be set at less than nine quarters per acre; eighteen acres of wheat, which stood well with short but plump ears, we valued at five quarters per acre; eighteen acres of rye, partly cut, with the straw above six feet high, would probably produce rather more than the wheat. There were six acres of white poppy, of which every plant was strong and upright, and the ground under it as clean as a garden:

we are no judges of this crop, but we were informed that the expected produce would be about seven or eight hectolitres (twenty to twenty-three bushels)* per acre: six acres were in potatoes, expected to produce eight hundred hectolitres (two thousand two hundred and seventy bushels:—three hundred and seventy-eight bushels per acre.) A small patch, about an acre, was in carrots, which looked fine and large; twelve acres were in clover, nearly the whole of which was cut green to give to the cows and horses: it produces three good cuts in the year where it is not allowed to go to seed. The ten acres of heavy land were partly in beans and partly in wheat.

Thus we have one hundred and sixteen acres all profitably cropped, leaving four acres for the roads and farm-buildings. Although this farm is within two miles and a-half of Courtray, the greatest part of the manure is collected on the farm. Rape-cake is used most profusely, and to this, as well as to the depth of the soil, the beauty of the flax is ascribed. Mr. De Brabanter usually sows his flax after oats, which, on this account, have been very highly manured. His urine-tank is very capacious, like a large cellar under his cow-house. The farm-buildings are arranged nearly as those of the last-described farm; he has a large dry vault to store his roots in winter. His stock consists of twenty-seven cows in milk, five or six heifers, nine horses, and three colts. The rent of this farm, including land-tax and other imposts paid by the tenant, amounts to 4880 francs, 187*l.* 15*s.*, which is fully equal to 270*l.* in England, taking the value of agricultural produce in the two countries as a measure.

There is nothing very peculiar in the practice of Mr. De Brabanter. He ploughs the land well, lays it in narrow stitches with deep intervals dug out by the spade, puts manure with every crop, more or less, keeps the land clean by weeding, and adopts a long and varied rotation.

The beauty of this farm consists in the equality of the soil of the great field, and its depth. This is not so much owing to natural advantages as to a long course of stirring and manuring, by which there is such an accumulation of humus as to render a sandy loam, naturally of moderate fertility, equal to old garden-ground, absorbent and retentive of moisture, without being wet. The labourers on this farm were mostly lodged and boarded in the house, and they had all the appearance of being healthy and well

* A hectolitre is 2·837 Winchester bushels.

fed. The farmer himself is a tall athletic man, with a good-natured, but shrewd countenance: he seemed very ready to give every information respecting his farm. His wife, equally active, superintends the dairy, and took some pride in showing us in a cool vaulted cellar numerous pans set on the brick floor filled with the last milking, and deeper vats in which the milk of the preceding day had been put in its progress towards churning. The milk, even when it is not intended to be skimmed, is always set in shallow pans for the twelve hours before it is poured into the vats, and the different milkings are kept separate.

The next farm which we shall notice is somewhat different from the two preceding, and if the land is not quite so carefully tilled it is made very productive from the quantity of stock kept upon it. It is situated between Furnes and Dixmude, at a place called Stuiveskenkerke. It partakes of the nature of a polder farm, for the land may be considered as an old polder. The extent of the farm is considerable, upwards of four hundred acres, of which two hundred are in rich natural pastures; the remainder is cultivated with the plough. The soil is here a good stiff loam, having the appearance of a clay, but it approaches more nearly to a marly soil, which crumbles when moderately wetted. It contains a considerable proportion of calcareous matter mixed with sand and clay, and it is decidedly of a superior quality to that of the two preceding farms. It requires less manure, but is more difficult to cultivate, both the extremes of wet and dry in the weather rendering the plough useless. In the first case the surface is converted into mud, and in the latter it cannot be ploughed, for if sufficient strength were applied it would rise in large clods which would harden in the sun, and remain so till continued wet or frost crumbled them again. Wheat and beans are principal crops, and the latter are more carefully cultivated than we have seen in any other part of Flanders; they are planted in rows, in imitation of the kitchen-gardeners. A drill is drawn with a hoe, and beans are deposited in it three or four inches apart; the earth out of the next drill serves to cover the seed. The distance between the drills is about ten inches or a foot, which in rich land is too near. When the beans are out of the ground the intervals are hoed. The produce is from three to five quarters per acre, but might be more with wider intervals, and more effective hoeing.

The rotation of crops on this farm is generally—1, fallow; 2, winter barley; 3, beans; 4, barley or wheat; 5, beans, clover,

potatoes; 6, wheat; 7, oats. The fallows are not ploughed before winter, but four times in spring and summer. Thirty cart-loads of manure in a long state, without the straw being much decomposed, are put on before the last ploughing, and the winter barley is sown in October: the produce is eight quarters per acre. Wheat on the same preparation produces from four to five quarters, so that the land is better suited for barley, and this last gives a better return with less exhaustion of the soil: every year a small portion of the pasture is broken up, and sown with colza. This would probably not have been permitted, had the farm not been occupied by the son of the proprietor.

The natural fertility of the soil is shown by the succession of crops produced on the newly-broken-up land without any manure, viz., colza, wheat, beans, barley, beans, wheat, clover, wheat, beans, oats. After this scourging it is no wonder that the soil wants rest, and this is given without much care by merely allowing the natural grasses to spring up without the trouble of sowing the seeds. It takes three years before there is any tolerable pasture, but, as it remains twenty years or more in grass before it is broken up again, the deteriorating effect of the cropping is not observed. How much more productive might not the land be made by more judicious management! The whole of the farm has repeatedly undergone this process, and must have been extremely rich at first. At present it requires repeated manuring to produce even average crops, except on that portion which has been broken up from old grass. Under a regular and judicious course of convertible husbandry, this land might be kept up in the highest state of fertility, and the ultimate profit would be much greater.

If we cannot altogether praise the management of the arable land, we must do justice to that of the dairy and stock. Here the finest and richest butter in the world is made. The stock consists of twenty-four milch cows, twenty-eight yearling calves, twenty-eight two-year old heifers and steers, and fifty bullocks. All these are wintered on straw, hay, and split beans. The straw is cut into chaff, and the farmer, Mr. Graeve, son of the proprietor, a spirited young man, has procured from England a machine for cutting chaff, which is to be worked by a horse, in the same mill by which he churns his butter. The bullocks are fattened on the pastures, and are fit for the butcher by the end of July or August. The weight of the carcase, when slaughtered averages ninety stone, of eight pounds each, and sells for 12*l.*, or 2*s.* 8*d.* a stone. The cows

give each, on an average, twelve quarts of milk per day. He churns three times a week, making forty pounds at each churning. The cream only is churned in a barrel churn, which is turned by a horse. The butter comes in one hour and a-quarter in summer; in winter it takes two or three hours. As soon as it is taken out of the churn it is well washed, to get all the butter-milk out, and immediately salted: before night it is worked again, and more salt is added. It is then put into the cask, and brine is poured over it. It sells for one franc (10*d.*) the pound of twenty ounces. This butter is famed for its keeping, and is therefore much sought after for ships' provisions. In summer there are fifty labourers on this farm, half of whom are boarded and lodged, and have from 8*l.* to 12*l.* yearly wages. The day labourers have 9*d.* a day, and their food.

The calves which are reared, of which there were twenty-eight when we visited the farm, have per day a bushel of oats and eight oil cakes amongst them, with hay and cut straw, from November to May. The fifty oxen have a sack of beans per day amongst them, and cut straw as much as they can eat. There were two hundred sheep, which are folded on the fallows, and, in the day-time, feed in the pastures and along the canals and dykes. When they are fat they are sold, and others bought in. None are bred, for, when kept long on this land, they become subject to the staggers and the rot in winter and spring; they are therefore fattened and sold as soon as possible.

The breed of pigs was much better than the generality of Flemish pigs, and appeared to have had a foreign cross, perhaps of a Berkshire hog; but there was no distinct account of this. The short legs and pricked ears clearly prove them not to be indigenous.

The cows are dry for three months in the year: at that time they have only straw to eat, with a small quantity of meal diffused in the water they drink. They calve in April or May, and when the grass becomes abundant each cow is expected to give five pounds and ahalf of butter weekly; and, as the pound is of twenty ounces, this is a large average, and shows good pasture.

Hay is made more carefully and better stacked on this farm than we have seen it on any other. The ricks are square, as they are in England, and hold from forty to fifty tons of hay: they are carefully thatched, and want only the pulling and trimming of the ricks in Middlesex, to vie with them in neatness.

There are seventeen horses kept for farm-work: these are mostly of a French breed, much more active and vigorous than the heavy Flemish horses. A good horse costs from 16*l.* to 20*l.* The cows are mostly Dutch, and cost from 8*l.* to 10*l.* each. They are large, and have fine udders. The colour is generally black and white, the horns moderate, and the skin fine. They are not so high as the Holderness cows, but their carcases are as large. Some of them give an astonishing quantity of milk.

This is one of the largest farms in Flanders, and may be considered as as intermediate between the upland farms and the polders. The buildings are scattered and irregular. It was formerly the property of a religious order, but confiscated and sold at the Revolution in 1794. The chapel still remains, but it is converted into a barn. The tenant purchased the land for a small sum compared to its worth, and his son is the present occupier. A small canal winds through the property, acting as a drain for the superfluous water, and at the same time as an easy means of conveying the produce to the farm-yard, and taking manure to the fields bordering upon it. With a little attention it is not difficult to make this farm produce everything that a frugal Flemish family requires, and enable the occupier to lay up a considerable sum every year. In the hand of a skilful and scientific farmer, a fortune might be realized on such a soil in a few years, by keeping up the fertility, instead of reducing it by excessive cropping of the land broken up from pasture: but especially by introducing improved breeds of cattle, and grazing them to advantage.

Not far from Roulers, at Newkerken, there is a small farm of about sixty acres, occupied by a Mr. Verpoort, which is worth noticing. The soil is a good sound grey loam of a moderate quality, the subsoil being retentive; the fields are divided by ditches four feet wide and three deep. Some trees and underwood are planted along some of the ditches, but not everywhere. There are no raised banks, the earth of the ditches having been spread over the land. The fields are all small, not exceeding three or four acres each, and mostly of an oblong shape. There was no water in the ditches when we saw it, but it is probable that in winter they are necessary to keep the land dry, as the country is so flat that the water must be a long time in running off. The principal produce on this land is wheat, of which there are eighteen or twenty acres every year. The wheat this year (1837) was sown on land which the year before had been cropped as follows: two

acres in beans, four clover, two potatoes, three colza, three flax, and four fallow,—eighteen acres in all. Mr. Verpoort thinks that it might be advantageous to have more fallow, as the land is very apt to be overrun with weeds in spite of every precaution, and a fallow now and then is unavoidable. The other crops besides wheat were distributed as follows: three acres in rye and turnips, four oats, five flax, three colza, four and a-half clover after flax, two beans, three potatoes, half an acre beet-root, five fallow, ten grass, half of which was pastured, and half mown. These ten acres lie along a low rivulet, and are flooded in winter. What makes this farm worthy of notice is the great proportion of wheat sown, and the variety of other produce, which return at a much longer interval, clover only every nine or ten years.

The whole of the work of this farm is done with two horses. There are thirteen fine cows, four heifers, two or three calves, one colt, and five or six hogs; and all these animals seem well fed. Except a few grains from the brewers, and some linseed-cakes, on food is purchased for the cattle, but the farm supplies all that is required. Mr. Verpoort used to breed horses, and sell them to English dealers who came round to the different farms, and bought three-year-old colts at a fair price; but none of them had been there for some time, at which he was dissappointed, having a very promising colt eighteen months old, very large and fat, which he thought would be much admired. This colt had been brought up in the stable, like a fatting calf, without much exercise. His feet were flat and wide, and, from good feeding, he was large and heavy. He might at one time have been admired as a heavy dray-horse, but he was evidently very unfit for muscular action; and, although as well shaped as most Flemish horses, he was not likely ever to become very useful.

The cows on this farm were milked three times a day for three months after calving, and only twice afterwards. They were fed in summer with clover cut for them, and brought into the stalls. Occasionally they were let out into the pasture, but only for a few hours at a time, and never in the middle of the day, when the flies would teaze them. In winter they had their brassin, made of turnips and potatoes cut in pieces, and chopped straw, boiled together in a copper, and some linseed-cake added to this. Sometimes beans were soaked in water for twenty-four hours, and then mixed with the brassin. The roots were cut by a machine something like our turnip-cutter, but not so perfect. This is the only

farm where we have seen a machine, as a spade is the usual instrument with which roots are cut. The chaff-cutter is exactly like our comman chaff-box, where the work is done by the hand; and, except where horse-power can be applied, or the chaff-cutter can be attached to a mill, the hand-box is, perhaps, the instrument which will cut most chaff in a given time by mere manual labour. The cows are of the Dutch breed, and apparently very good milkers. Mr. Verpoort fattens calves twelve month old, and thinks it more advantageous than if he kept them longer. This young beef is probably more readily disposed of in Flanders than it would be in England. All the labourers on this farm are fed in the house. The women have five pence and the men eight pence a day for wages, which makes the food to be reckoned at only three pence per head per day. A labourer obliged to find his own food could scarcely provide himself at so cheap a rate, but the farmer, who has everything from his own farm, finds that it is more economical to feed the labourers, even at that low rate. They have for breakfast bread and potatoes, with *tea*, as it is called, but it is a very weak infusion of that herb, and may be better called hot water with milk in it. For dinner they have a soup of butter-milk and bread boiled in it; after that they have potatoes and a bit of salt pork. For supper skimmed milk or butter-milk and potatoes.

The hogs are kept in separate dark styes, and fed on beans and the remnant of the brassin. They are six months or more in fatting, and then not remarkably fat.

The whole farm is in very good condition, and clean. The beans are sown in the furrows after the plough. The produce per acre, on an average, is four quarters of wheat, seven of oats, four of beans. All the roots are consumed on the farm. The land does not suit barley so well as wheat. The clover is usually sown amongst the wheat in spring. Flax is sown after oats, and colza after rye and turnips, which two last always come after wheat. This seems to be the most universal practice all over Flanders.

No sheep are kept on this farm, but a neighbouring farmer, who has eighty acres, keeps one hundred sheep, which he fattens, not by pasturing them, but by feeding in the stable like oxen. They have clover cut for them, and sometimes partake of the brassin. They get fat, but whether the flesh is well tasted when they are killed is more than we can say; the principal object is profit, of which the dung forms an important item.

On another farm situated near Grammont, the property of Mr. Spital, who is a great *amateur* and breeder of English blood-horses, we found the soil of a still stronger nature, but the cultivation very similar to the last. The name of the tenant is Van der Stude, a sensible and intelligent farmer, who seems to be well acquainted with the practice of the best farmers. He holds about one hundred and thirty acres of land, of which three-fourths are arable, and one-fourth pasture. A third of his arable land, or about thirty acres, is in wheat, ten rye, fourteen oats, fourteen clover, ten flax, twelve colza, three beans, three barley, and six in potatoes. There is no fallow, yet the land is clean. It seems not so wet as the last, and this may account for the fallows not being so necessary. He sows turnips after rye or colza. The colza plants are raised on the land which has had clover upon it, with one ploughing. The flax is sown in March, on clover ley also, with only one shallow ploughing, which is given before winter; but the land is repeatedly harrowed before the flax is sown. Everything which is grown on the farm, except wheat, flax, and rape-seed or colza, is consumed upon it. His urine-cistern is twenty feet square, and seven feet deep, but he says that it is much too small. There is a smaller cistern under the dung in the yard, from which the drainings are occasionally pumped up, and spread over the dung, to accelerate its decomposition. The produce of the land is from four to five quarters of wheat per acre; the same of colza, but this last is worth one-fourth more than the wheat. The flax is sold on the ground at about sixteen pounds an acre, the farmer feeding the labourers who pull it;—this is a lower produce than where the land is differently prepared for this crop.

The stock consists of seventeen cows, five calves, and a few heifers, nine cart-horses, and three colts. The labourers are fed and paid exactly as in the last farm. A few hops are grown on about half an acre.

Near Alost we met with one of the smallest farms, which will maintain a family without other work: it was barely five acres. The house was much larger than such an occupation warranted, but it was an old farm-house, and the land had been divided into small holdings, leaving only five acres to go with the house. There was a small orchard of about a quarter of an acre, in which there were some thriving apple and plum-trees. The grass under these was good; and the only cow which the man had was led by the wife to graze there for a short time every day, apparently more

to give her exercise than for the food she could pick up. The grass seemed to have been cut for her in another part. This cow had cost eight pounds, and the man regretted that he had not had the means to purchase a second, as he could have maintained two very well. Half of the land was in wheat, the other half in clover, flax, and potatoes; so that the clover did not recur sooner than in six years, the flax and potatoes in nine. As soon as the wheat was cut, he began to hack the stubble about four inches deep with the heavy hoe, and as fast as he got a piece done it was sown with turnips, after having some of the contents of the urine-tank poured over it; for small as the farm was, it had its reservoir for this precious manure. Thus a considerable portion of the wheat stubble was soon covered with young turnips of a quick-growing sort, which, if sown in the beginning or middle of August, were fit to be pulled in November and December, and stored in the cellar for winter use. There was a small patch of cameline, which was sown less for the seed than for the stem, of which he made brooms in his leisure hours in winter. But these hours could be but few, and only when snow covered the ground, and prevented him from digging and trenching, which was a constant operation; for the whole five acres had to be dug in the course of the year, and as much of it as possible trenched, the soil being a stiff loam of a good depth, which was much improved by trenching and stirring. The milk and potatoes fed the family, with the addition of a little salt pork, for a pig was fed on the refuse of the food given to the cow, and a very little corn, and consequently was not overburdened with fat. Most of the wheat and all the flax were sold, and more than paid the rent, which was not high—about 10*l.* a year, without any rates, tithes, or taxes. Incessant labour kept the man in good health, and his wife was not idle. They had two or three young children, one at the breast: but, except the wish for another cow, there seemed no great dissatisfaction with their lot, nor any great fears for the future. They had no parish-fund to fall back upon, not even a union workhouse; but, had they come to want by unforseen accidents, they would have found the hand of private charity stretched out to help them.

We have before alluded to a farm of which the occupier kept ewes for the sake of their lambs, which he alone in the neighbourhood fatted for the butchers. His name is De Keyart, and his farm is situated at a little distance from the neat and flourishing

village of Hamme. It consists of sixty-five acres, of which five are meadow, near a little rivulet. The ewes are kept as another farmer would keep cows. He considers the keep of one hundred sheep as equal to that of fifteen cows. He has, however, five cows also; and three horses do the work of his farm. His rent is about thirty shillings an acre,—a considerable rent, but small in proportion to the price of land, which here sells at an extravagant rate, not paying two per cent. for the outlay. Hamme is in the Waes country, where the cultivation is carried to the greatest perfection. One-sixth part of Mr. Keyart's farm is trenched two spits deep every year, which costs him 30 francs—about 1*l.* 5*s.*—per acre. This shows that the land is light, and the trenchers expert, to be able to do it at that price. The first crop on the trenched ground is potatoes, after the land has had twenty tons per acre of good yard dung spread over it. This is ploughed in four inches deep. After a fortnight an equal quantity of dung is put on, and this is ploughed in seven or eight inches. It must be observed that in ploughing the ground is turned completely over, so that the dung lies under the furrow-slice. The second ploughing does not bring the dung first laid on the surface again; but the point of the share, going four inches under it, lifts it up enclosed in two layers of earth; that which had been above the first dung is turned down upon the last portion, and the four inches last raised are turned to the surface, so that there are two distinct strata of dung, if we may so express it, one four inches under the surface, and the other eight. The advantage of this method must be obvious; and the ploughmen who can execute it should not be despised. Potatoes are planted on a part of this ground, and hemp sown on the remainder. The potatoes are put into holes made with a blunt dibble, and it will be perceived that, if they are put in six inches deep, they are placed between two layers of dung, and cannot fail to grow readily in such a rich and mellow bed. When potatoes are fairly up out of the ground, the earth is stirred and raised around the stems, and liquid manure is poured on the little heaps thus made. It is not surprising that with so much manure a great crop should be produced: but this manure is not all put in for the sake of the potatoes only, but for the flax, which is to follow, for which the dung should be well incorporated with the earth, and the land very clean. For the flax rape cakes dissolved in urine, or, what is preferred, *vidanges*, form the chief manure. Carrots are sown soon after the linseed,

if not at the same time. In weeding the flax great care is taken not to pull up the young carrots; when the flax is pulled the carrots are already very forward, and, by the help of the urine-cart, soon swell to a good size. After the flax and carrots the land is manured with fifteen tons of dung, which is ploughed in, and wheat sown in October. The next crop after wheat is, as usual, rye and turnips with six tons of dung. Then oats without dung; and, after them, buckwheat also without manure. The course then begins again with a fresh trenching. This is the usual course in the sandy loam of the Waes country. But what distinguished Mr. De Keyart's farming is his flock of ewes. Of these he has 100, who are carefully fed in the yard in summer and under cover in winter. All their food is brought to them, and as the lambs are the principal object, the ewes are well supplied with roots and corn in winter. The old crones are fatted off regularly. The manure is collected carefully: what can be washed into the tank goes there; the more solid part is mixed with earth before it is put on the land. His crops are as those of his neighbours, viz.:—wheat about four to five quarters an acre, flax worth 20*l.* an acre, hemp 12*l.* In 1837 there were on the farm twenty acres of wheat, eight of flax (part with carrots and part with clover,) three of hemp, four of clover, four of oats, two of buckwheat, fifteen of rye and turnips, two of potatoes, (fifty-eight acres in all.) The remainder of the sixty-five acres is pasture and homestead. The wheat is thrashed with the instrument described in page 31, and the chaff beat off is boiled in the brassin. Here we observed some small stacks of wheat neatly thatched, which might contain eight or ten loads of straw in each. The making and thatching of these is here a separate trade.

In the neighbourhood of Tamise there are many small farms chiefly cultivated by the spade, which are perfect models of this species of husbandry. The farm of a man named Everart may be taken as an example. He has eight acres of land, and keeps three cows. The whole is cultivated by himself, with the help of a labourer during three months in the year, who is chiefly employed in trenching and digging. The manure is carried on the land in wheelbarrows. The land is much poorer than in the farm we noticed near Alost. The first crops after trenching are buckwheat and potatoes—the latter with all the manure that can be spared: as many as sixty tons an acre are frequently put on. By this means the produce will be one hundred and twenty sacks, each of

200 lbs. weight, or nearly twelve tons, which is a very large crop on such a soil. After potatoes he sows wheat, then rye and turnips, then flax and clover, wheat, rye, and turnips: this is the regular course, which is only varied by carrots being sown in part of the flax, so that the clover may not recur too soon on the same ground. The cows are kept in stalls with their heads completely separated from each other: each cow has her own trough, and cannot interfere with her neighbour. The partition goes back as far as behind the shoulders of the cow: when she lies down she cannot see any of the others. The food is given to them from a narrow chamber before them, in which are the troughs for the brassin, so that they may literally be said to feed like pigs. They are cleaned and curried like horses.

The habitation is neat, only one story high, containing a kitchen and two chambers, with a small garret over these. There is a small barn, cow-house for three cows, with a calf-pen. There is a place where a horse might be kept; but a horse would only be profitable if there were more land; at present his keep can be saved. The urine-tank with the privy over it is an indispensable part of every farm-yard, however small. The wheelbarrows, which are used instead of carts, have a large wheel, and the frame is light. They are calculated to carry dung and sheaves of corn. The liquid manure is carried to the field in a tub, sometimes by means of a pole between two men, or a man and a woman, sometimes on the wheelbarrow. It is poured out by means of a bowl with a long handle, and which can take up liquid and semi-liquid substances equally well. There is an appearance of comfort in these little farms which is very pleasing. Hard work, instead of being here thought an evil or a hardship, is thought essential to the health and comfort of the individual. The children are brought up in industry. It is interwoven with all their associations; and when the young men marry they find wives who are brought up in the same manner, and are useful helpmates to them. The great ambition of the small Flemish farmer is first of all to be able to set up his children, by giving them what is indispensable in taking a small farm. If he has been very successful, and at the same time very frugal, he will hoard his savings till he can buy a few acres of land of his own. If he can build a house he then has arrived at the utmost point that the most sanguine man can look forward to. There are many small proprietors who have risen slowly by the labour of their own hands; and their habitations

show, by their extreme neatness, and the care taken of everything about them, that they feel a pride in enjoying the just reward of honest industry.

CONCLUSION.

From the general outline of Flemish Husbandry which is given in the foregoing pages, and from the examples which we have added, the general principles which pervade the whole system are easily discovered. The garden has evidently been the model for the operations of the farm. The spade has originally been the chief instrument of cultivation; and when a greater extent of farms necessarily introduced the plough, the favourite spade was not entirely laid aside. A Flemish farm of forty or fifty acres must still be looked upon as an enlarged garden; and if a comparison is instituted with the cultivation of land in England, we can only compare the Flemish husbandry, as far as tillage is concerned, with those large unenclosed gardens which are found in the neighbourhood of London, where the common vegetables are raised which supply the markets, where green crops are cut early for horses and cows kept in London, and where the soil is continually enriched by the manure, which is brought every time a cart returns from having carried out the produce. In these grounds the system is similar to the Flemish—deep digging or trenching, abundant manuring, and a rapid succession of crops. But there is one part of the Flemish system in which even the market-gardeners are inferior to the Flemish farmers. This is the collection and application of liquid manures. In England stable-dung laid in large heaps, and allowed to heat to a considerable degree, which is promoted by frequent turning and mixing the different parts together, is the principal manure of the market-gardener. It is put on the land in great abundance, and often without much attention to the state it is in, when the plough or the spade turns it into the ground. But the value of rich manure in a liquid state is not appreciated. The emptyings of privies and the refuse of slaughter-houses, which are carried in a semi-liquid state in tumbrils made on purpose, are mixed up with the stable-dung, to accelerate its decomposition: but there is no tank or pit in which it can be kept separate, or diluted to the degree required

to act directly on the roots of the plants, without injuring them by being too concentrated. This is the great secret of the Flemings, by which they have converted poor sands into rich mould, and produced in the lightest soil crops of wheat as fine and heavy as we do in our best clay-loams. The total ignorance or disregard of the power of urine on vegetation cannot be better shown than by the fact that a large cow-keeper, near London, having built a reservoir for the urine of several hundred cows, thinking to make some profit by the sale of it, found so little demand for it, at a very low price, or even for nothing, that he destroyed the tank, and let the urine run into the common sewers, to add to the variety of rich impurities which daily flow into the Thames. A gentleman from Flanders, to whom this was mentioned, asserted that in his country there would have been many applications to contract for all the urine, at the rate of 2*l.* per cow per annum—a sum which would have amply repaid the cow-keeper for the expense of his tank, and put a large annual sum into his pocket. It is not that gardeners are not aware that urine is a rich manure, but they want experience in the management and application of it, and every Flemish farmer could teach him this, if he would: and a few experiments with common attention would enable any intelligent man to find it out himself.

It would be of little use to observe the various methods of cultivation in other countries, if we did not endeavour to apply them where it may be done to advantage. The practices of gardeners are always a good example to farmers, and wherever they can be introduced on a great scale they are always found highly beneficial; so the methods adopted by the small farmers, and by those who cultivate by the spade in Flanders, might be introduced on a much larger scale on light sands in England. Instruments may be invented by which the ground may be tilled as effectually as by digging, and much more rapidly. The subsoil plough, lately introduced, is an approach to a rapid method of trenching. The gradually mixing the subsoil with the surface is readily accomplished by its use. The manuring with liquid manure may be effected on a hundred acres as easily as on twenty, provided there be a sufficient number of beasts kept stalled to produce it. If one tank could not contain all the liquid, it is better to have several in different parts of the farm. There is nothing to prevent a man of capital from multiplying his farms; and if he applies the same quantity of labour, and keeps the same number of cows,

in proportion to the number of his acres of land, he may have the same results. It would startle a farmer of four hundred acres of arable land if he were told that he should constantly feed one hundred head of cattle; and yet this would not be too great a proportion, if the Flemish system were strictly followed. It is probable that in a large farm, by means of a division of labour, the whole work might be done at a comparatively smaller expense. There might be buildings in different parts of the farm, in which the cattle might be fed, so as to avoid carrying the green food, or the manure, to a great distance. By having several trusty servants to superintend the management of the different departments of the farm, great regularity might be introduced; and a system of checks might be contrived, by which the occupier of an extensive farm might have all his work done as regularly and effectually as if he had only a few acres to manage. A large farm requires a large capital, and unless there be very accurate accounts, not only of money paid and received, but of work done, of fodder consumed, and of the distribution of the labour of men and horses, so as immediately to detect any extravagance or error, and at all times to show the profit or loss, there can be no inducement to apply capital to the cultivation of land. The Flemish farmer is contented to live, and bring up his family. The proprietor is satisfied if he gets some return, either in rent or produce, adequate to the value of his estate: but the speculator who embarks his capital expects to have a fair interest, which will cover his outlay and his risks. Agriculture has not often presented advantages sufficiently tempting to induce mere speculators to embark in it, yet considerable fortunes have at times been made by improving land, and no doubt may be made again. The failures have been owing to want of prudence, as well as to the want of a practical knowledge of agriculture. A man who would embark his capital in farming should have served an apprenticeship: he should have managed a small farm before he attempts a large one. But if he has acquired experience, and expects no miracles, he will find that, by attention, perseverance, and skill, he may not only gain a decent livelihood by cultivating the soil, but that he may invest a capital in agriculture, so as to pay him a very handsome interest without much risk.

ANALYTICAL INDEX.