THE

FLAX INDUSTRY;

ITS

IMPORTANCE AND PROGRESS:

ALSO

ITS CULTIVATION AND MANAGEMENT,

AND

INSTRUCTIONS IN THE VARIOUS BELGIAN METHODS OF GROWING AND PREPARING IT FOR MARKET;

WITH

EXTRACTS FROM THE ANNUAL REPORT OF THE ROYAL IRISH FLAX SOCIETY, AND A WORD ON CHEVALIER CLAUSSEN'S INVENTION OF COTTONIZING FLAX.

BY E. F. DEMAN,

LATELY TECHNICAL INSTRUCTOR TO THE ROYAL FLAX SOCIETY IN IRELAND.

"Omnium rerum ex quibus aliquid acquiritur, nihil est Agricultura melius, nihil uberius, nihil dulcius, nihil homine libero Dignius."

Cicero de Offic. lc. 42.

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FLAX INDUSTRY;

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THE VARIOUS BELGIAN METHODS OF GROWING AND PREPARING IT FOR MARKET.

DEDICATED

TO THE

LANDLORDS AND FLAX-GROWERS

OF

THE UNITED KINGDOM,

BY

THE AUTHOR.

London, 1852.

PREFACE.

In whatever capacity it may be, every individual must feel gratified in finding himself in a position able to embrace a mission in which he can make himself useful to society.

The character of my task is of such a nature that I feel confident that I can do justice to the cause I am advocating, my principles being not so much based upon theory as upon a long and practical experience, and therefore what I shall advance in this present little work in support of a branch of industry is based upon facts so evident, so palpable, and so much in harmony with the exigencies and circumstances of the state of things in this country, and especially in Ireland, that I feel very confident that my efforts and exertions will meet with the expected success.

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Continued.

CONTENTS

OF

CULTIVATION AND MANAGEMENT OF FLAX.

THE FLAX INDUSTRY,

&c. &c.

INTRODUCTION.

STRONG, energetical demonstrations and evident facts have been of late brought forward to overcome the prejudice which the agricultural public, especially in England, had for some time past entertained against the flax culture. The task, therefore, of advocating and supporting the flax industry at so critical a moment was not a very agreeable enterprise, considering the many opponents it had to contend with. But in justice it must be confessed that through the exertions of a few individuals the former prejudices have faded away, and the flax culture has now become the topic of inquiry and of general interest, as well in the agricultural as in the commercial circle, and must necessarily ere long take its rank among the most profitable staple commodities of British agriculture and manufacture.

After having passed over almost every county in England and Ireland, and having analysed

different sorts of soil and water, I can confidently assert that this beautiful country is capable of producing as good and even better qualities of flax than those countries from whence the finest flax is actually imported; and it is a fact beyond all dispute that its geographical position as well as the elementary properties of the soil and water are most admirably well adapted for the growth and preparation of this valuable plant; in fact, so remarkable a combination of facilities for this industrial success is rarely to be met with. Let us, therefore, avail ourselves of the advantages Providence has favoured our soil and climate with. For to America we have to look for our raw material of cotton, for wool and silk we have to look to other countries; but in point of flax it is quite different, having every facility and advantage given us to produce it in abundance.

The flax plant is without contradiction (sans contredit) by far the most lucrative, productive, and profitable plant that the soil can produce. The flax plant is not only an agricultural plant, but assumes at one and the same time the name of commercial plant (plante commerciale).

In its agricultural form the flax plant produces already infinitely more profit to the agriculturist than any other agricultural plant.

However, it is only when the flax plant begins to assume her commercial form, that at every

stage of process the value increases with an amazing rapidity, and in accumulating the merits of the plant of both agricultural and commercial character, the benefits derived from her productions are immense. Not forgetting that the social and moral advantages derived from this wonderful plant are not less worthy of serious and earnest consideration. No; there is not a stage in the progress of this delicate plant, from the sowing of the seed to the bringing forth of the exquisite lace and cambric, which has not given rise to admiration and the most refined investigation and controversy.

The flax plant in point of producing articles of luxury and ornament (for the fashionable world) nothing, decidedly, will surpass the exquisite Brussels lace, called dentelle point de Bruxelles.* With this evident and wonderful fact before us of what the flax plant can produce through the agency of human skill and art, must we not look with some jealous eye to our neighbour friends, and

* Mademoiselle Emma Reallier, of Brussels, has exhibited at our Great Exhibition a Pocket-Handkerchief, No. 309, "Mouchoir en Dentelle, point de Bruxelles, en fil de lin travaillé entièrement," which has been sold in London at 500 fr., or 20*l*. This handkerchief did not weigh more than 16 dwt. troy weight; thus, in value, surpassing gold by eight times (calculated by weight). One acre of flax can produce 1600 handkerchiefs of that kind, which, at 20*l*. each, shows a sum of 32,000*l*. Enormous as the amount produced from an acre of flax may appear, I can assure and prove that there is no exaggeration in this statement, nor in any other statement made in this little work.

inspire ourselves with the confidence that whatever they can produce in this branch of industry, we can also; the more when positively assured that the plant which produces such articles as just alluded to finds in our soil all the nutriment requisite (and even in a much higher degree than in many other countries) to produce all what is exquisite, in fact, of flax.

Prompted, therefore, and encouraged by the most evident facts, let us profit of the favours bestowed upon this country, favours which human power neither can give nor take away.

It is therefore needless further to point out in the form of an Introduction how earnestly common efforts should be directed to the introduction and extension of a branch of industry, which in its various departments affords, from a given surface of land, employment to a greater variety of individuals than any other branch of human occupation: the agriculturist, the manufacturer, the machinist, and chemist—all are equally occupied in its cultivation and preparation.

Since the flax culture has been taken up with so much spirit, numerous applications have been made to me from agriculturists of all parts of the United Kingdom for information upon the best modes of growing and preparing the flax plant; and in order to answer those numerous questions at once, I came to the conclusion of writing

a few pages in the form of a pamphlet,* in which I have illustrated the different processes connected with the flax industry, and especially those modes which are so successfully adopted in that famous flax-growing country, Belgium. My instructions and information have been sought for with much avidity through the medium of my little work.

Having thus shown in my former little work how the flax plant is to be grown and treated in its after processes, I shall now endeavour to show what great advantage this country will derive from the culture and manufacture of this valuable plant.

* 'Flax: its Cultivation and Management.' Published by Ridgway, Piccadilly.

I.

The Origin and urgent Reasons for having introduced the modern improved Methods of growing and preparing the Flax Plant in Ireland.

The flax spinning and linen manufacture, the most profitable staple commodity of the north of Ireland, could scarcely for some time past hold up competition in yarn and linen with foreign nations owing to their inferior raw material (flax), inferiority which was chiefly caused through the mismanagement of the flax plant. The evil consequence had become of such nature that the linen manufacture and yarn spinning in the north of Ireland was upon the point of losing its rank in the commercial world. This state of things could not last, or the flax spinners and linen manufacturers must come to the conclusion of entirely giving up the use of Irish flax, and depend altogether upon the foreign raw material (flax), or take some prompt and decisive steps to improve their own flax.

This was the position in which the most profitable staple commodity of the north of Ireland

was placed in 1841. The chief manufacturers, so well known for their commercial spirit, genius, and enterprise, were well aware from whence the cause of their commercial degeneration originated; they had ample means to judge, from the nature of their flax fibre, that their soil and climate were most admirably adapted for the flax plant; they had, indeed, already often meditated upon the means by which this progressing evil could be remedied; but it was not altogether in their reach to do so. The steps must be conjointly taken by the landlord, manufacturer, and flax grower, and it consequently required a sort of national association.

The most spirited gentlemen among the flax-spinners and linen manufacturers made, therefore, an energetical demonstration to some of the leading landed proprietors, showing them the urgent necessity of coming to some measures to improve the culture and preparation of the flax plant in the north of Ireland. It was with that great object that in March, 1841, a society was established at Belfast under the title of the "Royal Flax Society for the Promotion and Improvement of the Growth of Flax in Ireland."

Permit me on this occasion to say, that a few months after this I was chosen to be the technical instructor of this society; and although the task was a very laborious one, I considered it my

duty to lend my humble services to promote so important a national cause.

In hereafter quoting the first leading features connected with the progress and the improvements which were made during the first years of the Flax Society's existence, I shall avoid, as much as possible, to bring in my name and proceedings, from fear that the public may think that by so doing I am attempting to attribute to myself a great share of the credit which is naturally due to those individuals who have so earnestly exerted themselves to promote this great branch of industry. The most interesting and important progress connected with the flax industry which have taken place for the last ten years in the United Kingdom are decidedly those that were accomplished in 1841 and 1842 in the north of Ireland. I feel therefore rather anxious to give, in the commencement of this little work, a brief sketch of some of the most striking improvements which occurred during the two years that I had the pleasure of lending my humble services to the Royal Flax Society.

II.

The Aspect, Agriculture, and Soil of Ireland.

I should deviate from my task in entering upon agricultural or other matters further than those connected with the flax plant; but in passing I cannot refrain from expressing a notion upon the aspect, soil, and Irish agriculture.

My native country, some parts of France and Germany, being the only countries in which I had travelled, and having read a good deal of the picturesque views and fertile soil of Ireland, I felt naturally very anxious to see something from which I had a favourable imaginary notion, the more so because the country where I was brought up, Flanders, is exceedingly low, flat, and unpicturesque.

The coast before arriving at Dublin seemed to me most charming; the picturesque views, especially at that season (June), made really a captivating effect upon me. I remained in Dublin for some days, and paid a few visits to the neighbourhood, which appeared to me also most beautiful, and the aspect of the country altogether I admired much.

But in travelling from Dublin to Belfast, when

I began to give my attention to the agricultural department, I could see nothing but oats, not having yet reached more than eight inches in height; the potatoes had only begun to show themselves; the few fields of wheat I could see looked very poorly; the fourth part of the land was in pasture and lea;* and the weeds appeared to be pretty predominant amongst all those crops.

Having but a few days previous left Belgium, I had yet before me in imagination the wheat, flax, rye, barley, oats, rape, &c., most of which crops had already reached the height of a man; indeed the contrast between the crops of the two countries was immense, and yet the good crops stood on a poor soil (the Flanders), the others stood on a soil rich enough to manure the soil of the Flanders. Besides, the one country had to struggle against powerful elements,—the other country, on the contrary, was protected by those elements. Unwillingness and neglect must therefore be the only cause of this state of agriculture. Stupified as I was, I questioned myself and said, Were such lands in the hands of the Flemish farmer, would he not make 5*l.* more of each acre? † I

* There is a great deal too much of pasture and lea in Ireland. It is a very easy way of farming to keep a large portion of a farm under grass, but the soil should be almost in constant motion; this, at least, is a term used among the most active agriculturists.

† I regret to say that three-fourths of the Belgian farms range from 20 to 60 acres, and this class of farmers, notwithstanding all their industry, care, and good husbandry, can seldom raise an inde-

was fully convinced that he would do so, and in consulting my memorandum-book I found that Ireland had about 13,000,000 acres of arable land; this multiplied by 5 showed me the enormous sum of 65,000,000*l.* If such immense losses of national wealth were caused through evils over which human power has no control, as is the case in some countries, either from its geographical position, soil, or climate; but Ireland, so favoured in that respect, besides being governed by the most enterprising nation of nations, cannot be excused for not setting a better example to the agricultural world.* This state of things may perhaps more or less be caused through internal affairs; this, however, I shall not attempt to discuss, but shall only say that, whatever might have given rise to such, it ought not to exist.

Between Lisburn and Belfast a few acres of flax, the first I saw in Ireland, attracted my attention, and in a few minutes we arrived in the latter town.

pendency, in consequence of their small occupation. It is only those that farm from 130 to 150 acres that can do themselves some good; but this class of farmers often raise a capital of 20,000*l.* in the course of fifteen or twenty years. There is a sort of farmers who farm from 60 to 100 acres of their own property, who are generally also pretty well of.

* In giving a straightforward opinion on Irish agriculture I do not wish to hurt the feelings of any individual. One thing I shall say is, that I feel satisfied that many of the landlords, in the north especially, give every inducement and example for improvement to their tenants. The numerous model farms I have seen during my residence in Ireland are decidedly so systematically constructed that nothing better can be suggested.

III.

Defects in the Preparation of the Flax Plant and its original Qualities.

Being now upon the spot where I had to begin my task, it was rather an interesting moment for me, yet I could not exactly satisfy my curiosity so well as I should have wished, Captain Skinner being for the moment in Belgium, where he had gone with a few young gentlemen farmers to acquire some notion of the treatment of the flax plant; but being most anxious to see some flax fibre, I called at the extensive flax-spinning mill of Mr. Mulholland, a member of the committee of the Flax Society. One of the partners of the firm was kind enough to accompany me in the flax warehouse, where at least 300 tons of Irish flax were piled up and tied in bundles.

Nothing surprised me more than to see the manner in which it was brought to market.* Before having touched any flax fibre I could see the slovenly and neglectful manner in which Irish flax was brought to the spinners; but it was only when the gentleman who accompanied me

* In Belgium the flax, after it is scutched and ready for market, is packed up in bales the same as are raw silks.

began to give me some samples in my hands that I was quite aware of the complete mismanagement of the fibre. My first expression I shall always recollect was, *C'est fait par fantaisie, autrement c'est impossible.* Some samples were steeped to such a degree that the fibre had completely lost its natural strength; it could not therefore be expected to produce a strong, durable, manufactured article from a raw material which was much deteriorated.

This was one cause of the decrease of the linen manufacture in Ireland.

Another sample was shown me for inspection which I found not watered enough, a defect which causes the flax fibre to be of coarse, fragile nature: thus the articles manufactured of such raw materials are also of a coarse, fragile texture fabric, another great cause of the degeneration of the flax and linen manufacture. Other samples shown me were mixed with blue, grey, and black colours; and very badly cleansed and handled. These different colours, when spun and woven up together, must necessarily produce linen texture of a very inferior quality, through the slovenliness of which the spinning and linen manufacture had also to suffer considerably.

My great anxiety to see some flax fibre was to insure myself of the original quality of the Irish flax. Had its original quality not been good,

the improvements we were about to make should have been very limited, and consequently would have lost much of their merits and importance; because, whatever superior treatment may be given to the flax fibre, it is impossible to bring it to a great superiority if the flax do not possess some good original qualities: of course a common quality of flax can be improved to a certain degree by a superior treatment.*

I have now justly, and in a few words, deprecated the Irish flax fibre in several of its modes of preparation; but one great feature connected with this important branch of national industry is, that I had convinced myself, after a most subtle and careful examination, that I had traced in the Irish flax fibre submitted to my inspection some original qualities, the value of which is incalculable. Upon this great fact all the future improvements and success of the enterprise were based.

* Inferior qualities of Belgian flaxes, by their superior treatment, often assume a good appearance; but these are partly artificial qualities, by which the fabricant makes good profits, and by which the manufacturer is often a loser, as those flaxes will not spin the number for which they were intended. It is, therefore, in the interest of the flax-spinners to send good judges to the Belgian flax markets.

IV.

Defect in the Flax scutching.

Captain Skinner had now returned from Belgium with the deputation of young gentlemen farmers and some Belgian labourers who were brought over ready for the pulling campaign, the time of which was near at hand; but I was very anxious before this busy time arrived to visit some scutching-mills, in order to introduce without delay some improved machinery, being well aware, from the flax I had just examined, that the existing flax-scutching machinery must be of the most pitiable description. I therefore strongly impressed upon the secretary to urge the committee to take some prompt and decisive steps to improve the scutching machinery, proving that, amongst the numerous defects I had found in the preparation of the flax fibre, the slovenly manner in which the scutching operation was performed was decidedly one of the greatest defects, an evil which fell entirely and directly upon the flax spinner, and was one of the chief causes of the languishing state of the staple manufacture of the north of Ireland.

The committee, therefore, desirous to accelerate by every possible means any improvement which was strongly recommended, came at once to the conclusion to despatch me, accompanied with an interpreter, to some of the most intelligent owners of scutching-mills, and to suggest any improvement in machinery which I thought proper. At the same time the committee came also to the conclusion of offering 100*l.* for the best invented scutching machinery, as will be seen by an extract from the report of 1842, alluding to the subject as follows:—"As to the effect of premiums offered last year by your Society for the improvement of machinery, your Committee assure the meeting that through the United Kingdom it has awakened attention to the subject and aroused a great spirit of competition, for everywhere around us, and even from abroad, have reports reached your Secretary of preparations made by individuals to compete. Several models of considerable merit have, however, now been exhibited, two in particular, one for breaking and one for scutching flax, by Mr. Montgomery, Grove Mills, Belfast, which the Committee can recommend to the public as being calculated from its simplicity, comparative cheapness, from its doing work well, and giving from the straw a higher yield than mills now in general use, so much as to average above 24 lbs.

of cleaned flax from the 100 lbs. of straw; they have also adjudged it worthy of the 25*l.* premium at present; for as several machines have been reputed to be in progress, they deemed it expedient to keep open the higher premiums of 100*l.* for yet another year, when, should none superior in its qualities be offered to the public than Mr. Montgomery's, it will become entitled to the higher reward offered by your Society."

The new-constructed scutching mill from Mr. Montgomery was decidedly a wonderful improvement upon the old machinery. Several experiments were tried under my own superintendence; the saving in the quantity of flax was 25 per cent. and in the quality about 20 per cent. I have had great pleasure in recommending this new machinery to the public in my pamphlet published last year bearing the title of 'Flax, its Cultivation and Management.'

V.

Suggested Improvements in the Scutching Machinery and Handling of the Flax.

The flax-scutching mills about Londonderry, Coleraine, and Ballymoney were completely constructed to destroy to a great amount both the quality and quantity of the flax fibre. The improvements that I have suggested in that part of the country in machinery, and especially in skilful handling, may be estimated at 40 per cent. upon the old, slovenly, and destructive method. This great saving in one single process must give an idea in what state the flax fibre was brought to market at that period.

I was really astonished to see this neglectful state of things, the more so when I saw those powerful waterfalls which cause so much economy to this process (scutching), for it is remarkable to meet so many combinations of facilities all pointing out immense advantages which Ireland possesses in favour of a rapid progress in the flax industry.

The following extract from my journal will prove that the flax-growers and mill-owners were

eager in some districts to receive my instructions and information :—

"Bushmills, May 9th.—Mr. Deman has attended this day at a public meeting in the court-house, Sir F. W. Macnaghten in the chair; when, previous notice having been given, there was a very respectable attendance, and all present were exceedingly well pleased with the valuable information and instructions afforded by him. A great variety of questions were put to him by several of the company, to which he gave most satisfactory answers. It would be most desirable that he should come to this neighbourhood at the time of the pulling, as that is a very important stage of the process of managing flax.

"Sir F. Macnaghten having been obliged to leave the meeting, Mr. Trial was voted into the chair, when the above testimony in Mr. Deman's favour was passed unanimously.—(Signed) William Trial."

"*Monsieur le Secrétaire Capitaine Skinner.*

"MONSIEUR, Coloraine, le 11 Mai.

"JE trouve la machinerie des moulins à teiller le lin d'une construction désastreuse et misérable. La perte causée par le système actuel n'est pas moins de 25 per cent., et celle causée dans la qualité n'est guère moins que 25 per cent. Il faudra une réformation complète dans la machinerie, et il sera aussi indispensable que des ouvriers Belges soient envoyés pour instruire les ouvriers d'ici à manier le lin d'une manière plus adroite et gentille; car le mal reste encore plus dans la maladresse des ouvriers que dans la machinerie. Plusieurs cultivateurs paraissent disposés à suivre mes avis et conseils. Je leur ai fortement recommandé la machinerie de Mr. Montgomery, Grove Mill, Belfast.

"Je suis, votre tout dévoué,

"E. F. DEMAN."

So early as 1844 the Society in its annual report gave the following favourable account of

the improvements which had been accomplished in the scutching department during the last two years :—

"Amongst the most pleasing features in the progress of improvement which your Committee have to notice, are the strides towards perfection that have been made during the past years in the adoption of machinery to the breaking and scutching of flax. The prices offered for machinery by the Society last year gave an impetus to the ingenuity of machinists, which continues still in full force. Your Committee have heard with pleasure of new inventions or improvements on former adaptations which have been very successful when practically applied; and the most marked superiority in the manner in which flax is at present handled is the consequence. Several large landed proprietors have at great cost erected scutch-mills on their estate for the benefit of their tenantry, containing the most approved machinery; and they have thus conferred a boon which does honour to themselves, and is fully appreciated by their tenants. Your Committee have every reason to hope that in a short time flax-breaking and scutching machinery will be brought to a high state of perfection, and that the Society will no longer have to lament the inefficiency and waste which characterised the Irish scutch-mills before the commencement of the Society's labours."

On my return to Belfast from a tour in several counties I was requested by the Secretary to call upon the President of the Flax Society, the Marquis of Downshire, at Hillsborough, to whom I had a letter of introduction. His Lordship availed himself of my visit by putting to me numerous and interesting questions, which indicated that his Lordship took a considerable interest in the improvements of the flax industry.

His Lordship observed that the Irish farmer was slow in adopting innovations, and said, he gave me this warning in order that I may not be disappointed when I met some difficulties in my way. His Lordship also observed that he was quite aware that it would require several years before the great reformations and improvements which the Society had in view could be accomplished. His Lordship gave me a list of some of his most intelligent tenant farmers, requesting me to call upon them. He advised me in all circumstances to make the first attempt upon clever, intelligent farmers, because, his Lordship observed, that on the success of the first experiment much would depend. His Lordship requested me to write a short treatise expressing my opinion upon the qualifications of Irish soil and climate, and especially as to its suitableness for the growth of flax. The treatise was appended to the first annual Report of the Flax Society of 1841.

VI.

Flax-pulling in 1841.

Here the great moment for action is arrived. A few weeks will suffice to save 480,000*l.* to the Irish flax-growers! 60,000 acres of flax are thrown for the first time upon the care and discretion of the Flax Society. Half-a-dozen of intelligent young Irish farmers and a few Belgian labourers are placed under my superintendence, and with this small body I must set out to save to the flax-growers the sum alluded to.* For more than two centuries flax has been extensively grown in Ireland, and thus each year the sum of 480,000*l.* has been thrown away. This undoubtedly has contributed to some extent to the present state of things in Ireland. But now at least while the means are given to you,† put a stop to one of these evil causes.

Farmers, flax-growers, I come to announce to you that I bring you on each acre of flax that you have grown this season 4*l.* more than ever you made before from your flax-crop.‡ Save your

* I speak in my capacity of technical instructor of the Society.

† To the flax-growers.

‡ The seed is worth 4*l.* per acre for feeding cattle and pigs; this, upon 60,000 acres, amounts to 240,000*l.*

flax-seed, it will give good food for your cattle and abundance to yourself! Nay, I must offer you more; follow my further instruction, and I will give you another 4*l.* more for each acre of this year's flax-crop.* Will you accept this offer, or will you refuse it? Flax-growers, agriculturists, show at least that you are not ungrateful to those who are watching so closely for your interests.† But know that art and skill are the agents who will pay you this reward.

Notwithstanding the facilities given to the Irish flax-growers, three-fourths of them have remained indifferent for the last ten years to the generous appeal of the Flax Society; but of all the great defects which still exist in the various processes connected with the flax industry, none are so lamentable, so evidently absurd, and so much opposed to every good sense and economy, as to throw away such a valuable article as the flax-seed, and for no other purpose than to cause diseases.‡ The matter is indeed grave enough for

* In following the directions and instructions of pulling, steeping, spreading, and turning the flax, at least 4*l.* more would be gained upon each acre; this, upon 60,000 acres, amounts to 240,000*l.*, which together with saving the seed amounts to 480,000*l.*

† The committee of the Flax Society, landlords, and others, who support the Society.

‡ When the seed is taken from the flax, steeping is a most pleasant process; but, on the contrary, when the seed is thrown in the water together with the flax, the process becomes disagreeable, and may in some instances cause diseases.

the Legislature to interfere and to put a stop to such a wilful waste of property.

The flax question has often, and from early times, been under legislative consideration. A writer on flax says,

"The question of flax culture is one which is not now for the first time brought before the public. On the contrary, its importance has been recognised from the earliest times; and it has formed the subject of repeated legislative enactments at various periods, from the time of the 24th of Henry VIII., when it was enjoined that every person occupying land apt for tillage, should, for every sixty acres, sow one rood at least with flax,"

down to the year 1809, when a sum of 20,000*l.* was appropriated to encourage the saving of flax seed in Ireland. The subject has also been repeatedly before the public during the last ten years, in the annual Reports of the Royal Irish Flax Society, and in the various publications of Mr. Warnes and other persons who have applied themselves to its cultivation.

Again, the Royal Flax Society, in its last annual Report, alluding to the saving of the flax-seed, demonstrates, in convincing terms, the importance of this economy, alluding to the subject as follows:—

"Year after year the annual Reports have contained earnest recommendations that the seed of the Irish flax-crop, instead of being set with the stems in the pools, should be taken off by rippling, to be employed for sowing, sold to the oil-mills, or used by the farmer as food for his live stock.

The Society's instructors have constantly endeavoured to inculcate the importance of this economy; but so deeply rooted is the prejudice against saving the seed, that as yet it is only to a limited extent that farmers have attended to this advice. It has been repeatedly stated, that in all the flax-growing countries of the world the seed is saved; and that the finest of Flemish flax, rarely equalled in Ireland, is produced from plants from which the seed has been taken. Many farmers will not be convinced, and still continue to throw away a part of the produce for which the crop is alone cultivated in some countries, where the straw is used as thatch. Your Committee are, however, not without hope that a more rational practice will creep in by degrees; and they are pleased to learn that this year about 8000 bushels of rippled seed have been purchased at the Belfast oil-mills, from a few districts in the county of Down. When it is calculated that at least 100,000 acres of flax have been steeped in Ireland this year, without the seed having been taken off, and that the latter, at mere crushing prices, would be worth 300,000*l*., this lamentable loss of national wealth, which would alone be sufficient to feed 100,000 paupers annually, must be deeply deplored."

The flax-straw, in the course of four weeks, passes through four successive processes—pulling, rippling, steeping, and grassing. There was great defect in each and all of those processes. The flax was pulled very unevenly; the short and long were pulled together; coarse and fine, and portions of the fields that were lying, were also mixed together in the pulling. Instead of which, all these different qualities must be separated, as each sort requires a different time of steeping. This method gives decidedly more trouble; but when the people are skilfully instructed, the extra expenses are but trifling, considering the advan-

tages this new method has upon the wasteful manner in which it was before done. Hence it is from this pitiable neglect that results the unequal strength and quality of the fibre, so very deteriorating to the texture fabric.

To the enormous loss of not taking off the seed I have already alluded.

The steeping is a process of much importance, and yet requires nothing but care and proper attention to have the flax steeped in all its natural strength. This process was also much neglected, by which, in some instances, the flax fibre lost half its value. The grassing :—In this process the flax must be spread equal and regularly on the grass, and turned over every two or three days, instead of which the Irish farmers spread it on the grass almost like hay, in one place thick, in another thin, and without turning it at all: consequently one part of the flax was exposed to the atmosphere during ten or twelve days, but quite the contrary was the other side. From this resulted unequal colour, and in many instances a loss of 20 per cent. upon its value.

Almost all the supporters of the Society, and the advocates of the cause of improvements, were anxious to be visited by one of our instructors. Indeed it was a pleasure to call upon those who were prepared to follow the advice of the Society, because every man of good sense must evidently

see that the superiority of the Belgian methods were immense. It attracted, in many instances, large bodies of people to the fields where the different processes were performed. In fact, some gentleman or other gave generally notice that on such a day one of the Society's instructors was to arrive, and that the various processes then in train would be illustrated. This indeed was a capital plan to instruct the whole neighbourhood at once, it being impossible to call at every flax-field, the applications to the Society for instructors being so very numerous that all could not be attended to, the time during which those four successive processes are performed being very short.

The amount of good, however, that has been already accomplished during the first season of the Society's existence is immense; and one important feature connected with the great enterprise is, that it has been evidently proved that the original quality of Irish flax is superior to that of several other flax-growing countries; and when the improvements are accomplished in all their extent, Irish flax will necessarily have increased to 100 per cent. in value.

VII.

Flax Factorship.

In order to introduce the growth of flax more systematically, and as a great encouragement to the farmers to increase the growth of flax, I recommended strongly to the Committee the establishment of the flax factorship. The Committee approved much of my proposal, as will be seen by a passage extracted from the Society's annual Report of 1842:—

"The introduction of such a system would thus permanently establish amongst us the fullest amount of improvement that our soil and climate may be capable of; and your Committee have sanguine hopes that the period is not far distant when this branch of business will be taken up with spirit. Useful suggestions were given on this subject by Mr. Deman, who was himself a factor of long experience, in the treatise last published by him, to the public, and which was appended to the first annual Report, and has been exemplified most satisfactorily and successfully by him this season, in the treatment of a small quantity of flax which he had purchased on the foot, on his own account, in the neighbourhood of Mayo. This flax turns out equal to the finest qualities of Courtrai flax imported, as proved by the price actually obtained for it, being at the rate of 18*s*. per stone, or 140*l*. per ton."

VIII.

Preparation of the Land to grow Flax in Ireland.

Since my arrival in Ireland, the different processes connected with flax which I had to superintend came in a course of succession, and therefore I had not had an opportunity of suggesting improvements in the preparation of the land and the sowing of the flax-seed; and having now visited almost every district in the north of Ireland, I was convinced that, in order to lay a good foundation for the further rapid progress of improving the flax industry, another important step was required from the agriculturists flax-growers. The first defects in the flax fibre were caused through the bad management of the land. Short and long, coarse and fine flax, in one and the same field, are decidedly the consequences of the land being ploughed in furrows,* and the seed being sown unevenly.† In Belgium the land is always ploughed twice, sometimes more, according to the state which the land is

* The flax that grows in and near the furrow will be short; land for flax should be properly drained and sown flat.

† The spots where the seed is thin will produce a coarse plant; where the seed is thick it will produce a fine plant. It must be understood that a coarse branchy plant produces always coarse fibre, and the delicate fine plant produces fine silky fibre.

in. Great care is taken to sow the seed very evenly, and to select the best seed.* It is almost impossible to form an idea of the care and attention the Belgian farmer takes in preparing his land and selecting good seed for the culture of this plant, knowing that such is indispensable to secure a good crop. In a word, it must be said that it is upon the proper preparation of the land, sowing good seed, and sowing evenly, that the whole success of the flax improvements in its after processes are based.

It was under such considerations that I advised Captain Skinner, the Secretary, to impress upon the Committee the great necessity to send a few young intelligent farmers to Belgium, in order that they may acquaint themselves with the practical knowledge of the manner in which the land was prepared and the flax-seed was sown in that country.

The Committee, always ready to avail itself of any suggestion by which the views of the Society could be accelerated, sent over to Belgium four young men. Two of them I had great pleasure in recommending to a near relative of mine,

* The seed sown in Belgium is partly imported from Riga, and partly from their own growth. The seed sown in Ireland is generally bad foreign seed, and full of weeds, the extraction of which never was thought of. It is easy to conceive that an accumulation of those weeds, together with those already rooted in the soil, must be pernicious to this delicate plant.

with a request to give them every information respecting flax. The numerous letters written from Belgium by those young men were all published by the Committee; and I give hereafter the first letter of each of them, dated from the different quarters where they were sent:—

"At the committee meeting of this Society for the month of April, it was adjudged that a summary of the proceedings since the issuing of the Report of last December would prove highly interesting at this moment, and especially so the extracts from the journals and letters of the young farmers lately sent out to Belgium to take a practical lesson on the preparation of the soil for the flax crops and the sowing of the seed. To farmers generally it will prove instructive, marking the impression made on the deputation by the care and labour given in the tillage of the land by the Belgian farmer, the admirable system of agriculture everywhere instituted in that country, which includes all the modern improvements of draining, subsoiling, green cropping, and judicious rotation, which our agricultural societies are universally endeavouring to introduce amongst us; and the very active, diligent, and industrious habits of the people, with their extraordinary frugality and management of manures, collecting it from sources, preserving it with care, and applying it with a consideration and judgment never calculated on by us. To the landed proprietors, from a perusal of the shrewd remarks made by these practical parties, it will be obvious that advantages must accrue to those districts of country from which these young men are from time to time selected: being intelligent, and the most highly recommended of the candidates offering, and having facilities afforded them whilst travelling under the Society's auspices, and with such suitable introductions abroad as few individuals could command, these young farmers have opportunities of seeing and acquiring more than the public would generally infer from the limited

period during which they are absent; and on their return, labouring, as they are called on to do, as agriculturists for the Society; to introduce the improvements they have been witnessing, they are stimulated to an exertion which, were they left to themselves, they would not have the opportunities, and might soon lose the inclination to keep up; and as the novelty and first impressions wore off, old habits and views might gradually be resumed. But in their present case, the objects of an influential Association are to be promoted, as well as the individual credit and interest of the parties being at stake; and having the occasional visits and association of the Belgian superintendent-agriculturist (Mr. Deman), and the labourers brought over from time to time to assist him, ensure under all these circumstances a progressive improvement, and a ripening of conviction that will effectually guard against retrograding into former opinions. The good likely to arise to the country from these measures must be readily admitted, and that much may be effected through the agency of this Society, if its efforts are but adequately supported for a few years, and it but meets with the co-operation from all parties (but especially landed proprietors) which the importance of its ends in view so well merit.

"In January, 1842, the committee determined on sending a deputation out in spring to witness the preparation of the soil and the sowing of the seed.

"Two to be of those who visited last year, and two fresh parties, who were selected from the list of the former candidates."

"Sir, "Duffel, Monday, March 21, 1842.

"I am sorry it is not in my power to give you any information respecting the subject of the deputation as yet, as here they have not commenced to lay down the crops, nor will they for a week to come. However, we are instructing ourselves in their art of tillage; and I can confidently assure you, that until I came here I had only heard of agriculture; but now I have seen it. It is very easy indeed to draw a

line of demarcation between the Belgian and Irish farmers. The one is vigilant, industrious, and completely master of his business; the other is no tradesman, and a sluggard, who knows not what labour is, nor does he know how to convert his land to a good purpose. He would scarcely believe it, if he were told, that here they take two crops off the same ground in the same year, nor could he be brought to think it practicable. However, it is a fact that, by sowing green crops, such as carrots, with his wheat, rye, or oats, and on stubble, he will put in turnips, or plant rape; and in this way secures to himself an abundance of green crops, which serves to feed his cattle iff the house (for they never get out here). We have seen some ground which is in preparation for flax, and I never saw ground for garden seeds prepared with more care and attention. Might I take the liberty of requesting you to write to my friends, to say we are well?

"I remain, Sir, yours,

"*G. M. Skinner, Esq.*" "ROBERT BUNTING.

"SIR, "Hamme, March 26, 1842.

"I arrived here yesterday evening, after having been travelling for the last three days with Mr. D——. Mr. Haslett was with us. We were forty miles above Louvain, in the Walloon country, seeing a scutching machine, which Mr. D—— strongly recommended, and which I am convinced would suit the Irish farmer well; it is on the same principle as our thrashing-machines, and is worked by two horses; eight men can scutch at once, and each man can clean 45 lbs. of flax per day, and it is done so well that Mr. D—— assures me that flax will bring 10*l.* per ton more in the market than the same done by hand.* This machine does the work well

* I have every reason to think Mr. D. means to say that it is worth 10*l.* less than the flax scutched by hand. If the Belgian factor was offered to have his flax scutched gratis by the scutching-mills he would refuse the offer, knowing too well the great waste it causes, and the inferior quality it produces. So long as there are hands enough to scutch the flax by hand, it will be done so in that

without the least waste, and the expense of putting one up would be very trifling, as all the machinery in it is very simple; and I am sure a large farmer would save all the expense of putting it up in one year, or two at most; to any one having a thrashing-mill it would be still cheaper.

"No flax sown here yet, the weather is so backward; but all are ready to commence. The ground everywhere is prepared, and has more the appearance of a garden plot than anything else I know of; it has been ploughed three times, and in some instances (where the land is any way heavy) four times. The crops here look remarkably well, particularly the wheat, which certainly looks better here, and is further forward, than ours in May. If such weather as we have to-day continues, flax sowing will be general, and over in a week.

"The kindness and attention of your friend Mr. D—— surpass anything I could believe; he has dedicated three days to us entirely, and must have put himself to considerable expense. As soon as I see any sowing, I will write again.

"I remain, Sir, your obedient servant,

"Thomas Hardy."

"Sir, "Duffel, March 29, 1842.

"The instructions which I received previous to setting out on my present mission included, among others, one item with which I shall attempt to comply, viz. to write to the secretary, although I have little to communicate that may be regarded as having any particular reference to the great object contemplated by the Society in sending out the deputation to this country.

"On first view of this country I was struck with wonder at the difference which exists between the modes of agriculture pursued here and those followed in Ireland; here the rotation system is fully understood, and practised to its fullest extent; in fact, this country, as far as I have seen of it yet,

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country; it is a slow process, but it does not signify so long as it is an economical one, and gives employment to the labouring class.

may justly be compared to a garden on a large scale, in which all the different divisions are laid out and cultivated with the utmost precision and exactness. Indeed, I am convinced that the Belgian farmer manages his fields with far more care and attention than the generality of Irish bestow on their gardens; but if the farmers here regard one kind of crop with more interest than another, and bestow more care and attention on its culture, it is the flax crop. Although, owing to the wetness of the weather, farming operations of all kinds have been considerably retarded, yet throughout this neighbourhood lands intended for flax are in different stages of forwardness; but no flax has been sown as yet in this neighbourhood. I have also paid attention to their mode of hand-scutching, an operation in which they display wonderful skill and ingenuity indeed. I am led to think that a good deal of the difference which there is between the Belgian and Irish flax is to be traced to the difference which there is between their modes of scutching; and I am fully of opinion that, were the hand-scutching system introduced into Ireland, and the same care and attention bestowed there that the people of this bestow in the operation, the superiority of the Belgian flax over the Irish would in a little time cease to exist, and would only be known as matter of history; nor would Ireland then be annually drained of those vast sums which are now sent to this country for an article which our country would then supply in as great perfection as it is found here at present.* I am glad to be able to say that the weather appears to have taken a turn for the better, and, should it continue favourable for some time, I hope to be able in my next letter to treat more definitely on matters connected with my mission to this country, such as the preparation of ground for sowing of the seed, together with the subsequent processes with which the people of this country treat the culture of this very interesting crop.

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* If half of the flax grown in Ireland was scutched by hand it would create employment to thousands which are now idle through want of employment. Besides, the flax would fetch a much higher price in the market; a remark justly made by this Mr. Lawson.

"I cannot allow myself to finish this letter without giving expression to feelings of gratitude and esteem, which the kindness of these people have inspired within me. On my landing at Ostend, on first view of the natives I was very much prepossessed in their favour, and I can now say, after a residence of nearly a fortnight among them, that for honest simplicity and unaffected kindness they could not be surpassed by those of any country. They are cleanly in their persons, polite in their manners, and generally well educated. I hope, Sir, on receipt of this, that you will favour me with a line, containing any further instructions which you may deem necessary to give me.

"I am, Sir, your obedient humble servant,

"JOSEPH LAWSON.

"*C. M. G. Skinner, Esq., Belfast.*"

"SIR, "Hamme, March 30, 1842.

"I mentioned in my last that I had come to Antwerp, for the purpose of going to Louvaine with Mr. D——, and from that to the Walloon district. He was to have gone on Tuesday, but business prevented him going before Thursday. One principal object in going was to see a flax-mill; but we found a great deal more worth seeing than we expected. The mill I think calculated, in every respect, to meet the views of the Society, and I am almost sure, were they to get one put up on the same principle (with some improvements), that they would save the 100*l.* offered as a premium. The whole machinery is driven by two horses, and has stocks for eight men to work at. Enclosed you have a draft, as like it as I can draw it. The only thing I saw wanting was rollers. Three men were bruising the flax with crigs, the same as we do; the stocks are exactly like what you got from Courtrai, only stronger, and firmly screwed down. The handles are not so sharp, nor near so heavy, as what we use in our mills. The farmer let us see flax dressed by the mill, and the same flax dressed by hand, and Mr. D—— decided in favour of that dressed by the mill. One of the farmers we visited

always dew-riped his flax till last year, when he steeped a little to try it, and he says the difference is so great that he will steep it all for the future. We visited four different farmers, and saw all the land they intended for flax this season. It had all received a third ploughing, and had been very highly manured. Some of them said it would require a fourth ploughing, on account of so much rain having fallen. Wheat is always sown after flax, and gets a great quantity of lime. Flax is generally sown the second year after potatoes, and very often after white clover, being one year lea. Flax sowing in the Walloon district does not commence before the middle of April; nor is the flax sown at Hamme yet, except on very sandy land, and I believe their principal object in sowing it so early is to have it above ground before the drought sets in to prevent it from braiding, and to keep the sun from burning up the land. All the best of the land is to sow yet, and a great deal of it to plough. The weather is still very wet, and some of the land, I am sure, less than eight days of good weather will not dry it for the seed. The light sandy land is all ploughed in January and February, six inches deep. It remains in this state till seed-time, when it is well harrowed before the seed is sown. The teeth of the harrow is not more than 2½ inches long. Between harrowing for the seed and the sowing, the liquid manure is put on when the land requires it. The preparation of the good land is what I wanted to see most. The sandy land is fit for sowing after the plough, it is so loose; but the other turns up something like our own, and requires more pulverising. I would like to know what kind of weather you have in Ireland. I think, if it be as bad as here, I will be home time enough by the middle of April. Planting potatoes is the only thing that can be done here in the sandy land.

"Your obedient servant,

"HENRY HASLETT.

"*C. G. M. Skinner*,
"Secretary to the Flax Society."

IX.

Sowing Season.

The amount of knowledge which those young men had acquired during their séjour in Belgium was of incalculable value, especially for the sowing seasons. Those young men could now give evidence of what they had witnessed respecting the culture of the flax plant in a renowned flax-growing country.

The season of sowing the flax seed being now arrived in Ireland,* a small body of eight young men (all of whom had been over to Belgium) besides myself were now again deputed to those flax growers who had expressed a wish to have the services of an instructor. I was specially requested by the Committee to pay particular attention to the flax growers in the county of Tyrone, where it was considered that the greatest ignorance prevailed respecting the preparation of the soil and the sowing of the seed.

At my arrival in that county, I found many fields ready, as the farmers told me, for sowing the seed; but what must be my surprise when I saw the land in such a coarse, slovenly, unprepared state! the smallest lumps upon several fields were larger than a fist, some so

* 1842.

large as a head, besides weeds in abundance.* I asked if this was the manner in which they had always sown their flax seed; the answer was Yes, saying that they thought their land was very well prepared, and did not see what could be done more to it. I asked them if they thought that this delicate flax seed was likely to penetrate through those large stiff lumps of earth, and if the seed would thrive well amongst all those pernicious weeds. Upon my remarks their answer was as follows:—We have grown flax in this neighbourhood for many, many years, and it often pays us better than any other crop, and we should grow more of it if the sowing-seed did not come so expensive.† I remarked, then, as they found the seed for sowing so expensive, why did they not save their own, that the seed saved from one acre would give them sowing-seed for eight acres;‡ but they

* I would have recommended to plough their fields over again, and to bring some moisture to the top, which would have given great facility to bring it to a fine tilth, but they were not disposed to put themselves to any extra trouble.

† Here I asked to see the seed they were about to sow. It was bad foreign seed, a fourth of which was weeds. I told them that they must clean that seed, otherwise that this seed would for ever strive in their fields and make their land still worse than it actually was. But how were they to extract those weeds? They had never seen a sieve by which this process is performed.

‡ Twenty bushels would be about the produce of the seed, or perhaps more; consequently, that the seed of one acre could supply sowing-seed for eight acres. Is not this abuse a matter of surprise?

thought that taking of the seed injured the flax; but yet, they said, they had never tried it. I observed that I should call next season at the pulling time, and bring rippling combs and men to show them how to take off the seed, and that this seed was worth 4*l.* per acre; but for the present I must advise them to roll their fields intended for flax with a very heavy roller; after that, harrow it up, roll it again, and repeat the harrowing; that this was the only means to break the lumps,* besides requesting them to pick up the weeds carefully: in so doing I assured them that their flax crop would realise much more money than it did before. Upon this remark I received the following reply:—We have no objection to pick up some of the largest weeds, but we cannot roll, because we have no such things as rollers, nor are there any in this neighbourhood.

I must confess that it is rather a melancholy task I have imposed upon myself to hint, from time to time, upon the extraordinary, wilful ignorance in Irish husbandry, and the indolent, wasteful, slovenly habits which are to be met in a great portion of the Irish peasantry. If in common agriculture and husbandry there was something very scientific or above the reach of those people,

* The land is very stiff and heavy in that part of Ireland. In such lands, after the last ploughing, the harrowing and rolling should immediately follow, it being much easier in so doing to bring the land to a fit condition for sowing.

they could be excused; but everything connected with common agriculture and husbandry is so plainly pointed out in itself, of what is to be done and what is not to be done, in order to create them better comfort and ease; but really those people seem to be quite indifferent to any suggestions which tend to improve their social position.*

However, this unwillingness and wilful ignorance do not prevail everywhere; on the con-

* The following letter from 'The Times' of January last very much corresponds with my statements and opinion; and although I rather deviate from my task in publishing the same, I cannot help doing so on this occasion:—

MEN AND MANNERS IN IRELAND.—The following sketch of "men and manners" in the South of Ireland is given by the Rev. Mr. Townsend, a Protestant clergyman in Cork:—"They (the farmers) still adhere to the old system of agriculture, which under protection enabled them to live, as they were content, in the poorest way; and whether it is mental inability or pecuniary inability, they cannot be got to change for better. There is nothing here but poverty, the result of idleness. Those in possession of land are unable to pay for labour, although abundance can be got for 6*d.* per day for the best labourers—women for anything; I doubt not that 2*d.* per day would gladly be taken. There is imbecility in all classes—in the gentry class no mind for business, no turn of mind for anything but frivolous amusement—this descends from them to others. This is not my own opinion, but that, I may say, of every one capable of giving an opinion. Until there is a change of proprietors to show a better example, there is no prospect of a happy result. Here, in my district, there is all the appearance of prosperity in the upper classes. I could as soon raise the amount of the national debt as the small sum for the mistress of a school; but if I started a ball, a horse or a boat race, or such like, money would readily be found. I am getting, not faint-hearted, but hopeless, seeing that no permanent good can be done by a single individual. My life for the last five years here, I trust, has proved that I am willing to do my utmost."

trary, in some districts the farmers were quite disposed to adopt the improvements recommended by the Society, feeling convinced that the consequences must necessarily lead to the most happy and beneficial results, and the good spirit of the farmers of some districts is fully manifested in the following letter from an intelligent farmer near Newry :—

" Sir, " Loughbrickland, 18th April, 1842.

" I feel much pleasure in informing you that your visit at our agricultural dinner has done much good, and that the circulation of your reports has turned the attention of farmers to the necessity of improvement in the treatment of the flax-crops, and the first good effect has been the care and attention paid to the preparation of the ground for the seed. I never saw it so well done; in fact, the farmers are vying with each other who shall have the best prepared and neatest finished field. Mr. Deman can tell you this also. He sowed mine, and some five bushels for another person here. He is the best sower I have seen ; many persons come to see him in every field ; they seem quite surprised he gets on so quickly, and express surprise that he can do so, and yet sow so evenly.

" I have also pleasure in stating that every person who has joined the Society here is quite willing, in fact anxious, to give the Courtrai system a fair trial on a small scale, and follow out Mr. Deman's direction in every respect. I do trust that, from the interest which your excellent Society has been the means of exerting, and the consequent attention which is being paid to the flax-crops, that if the season be favourable, you will have at all events a much better crop than formerly.

" Your obedient servant,

" Thomas Marshall.

" *C. G. Macgregor Skinner, Esq.*,
Flax Society, Belfast."

X.

The Merits of the Flax Plant in its Agricultural Forms.

The Committee had now announced to the public, in her annual Report of 1842, that it had been proved to the flax-growers and the public at large, that some Irish flax had been improved from 50*l.* to the enormous increase of 140*l.* per ton. This were not only words, but facts realised by myself, and illustrated by an acre of flax purchased in the green state at Mayo, near Armagh.* Such a fact, once established, suffices to show to what amount Irish flax could be improved. Indeed these are features which will undoubtedly be worthy of a page in Ireland's history. The Society could now, with every insurance of success, continue her labours. The great difficulties which enterprises of such a nature have to contend with, especially at first, were now overcome.

The Committee was quite aware that it would require several years before such extraordinary improvements could be generally accomplished, and to that effect perseverance and support were necessary; but the landed proprietors especially

* The passage of the Annual Report of the Flax Society alluding to this fact I have already given under the head of "Flax Factorship."

had already appreciated the striking facts before them, and the great amount of good which was likely to arise through the agency of the Society. Indeed as early as 1842, the second year of the Society's existence, the 30,000 tons of flax which were brought to market from that year's growth had already assumed, through the labours of the Society, 10*l.* per ton more value than formerly, and this first fruits of the flax improvements were enjoyed by the flax-grower. The flax-plant figures only here in her form of agricultural plant; but, as I have observed in my introduction, the merits of the flax-plant, in her agricultural forms, are of a most beneficial nature. Besides the marked superiority of paying better than any other crop, it brings the grower the amount of his production in his pocket in a much shorter period than any other crop; and it necessarily induces or obliges the farmer to bring his land under good condition, if he wish to secure a good crop, in spite of his adverse or unwillingness to improvements in agriculture. The farmer, indifferent as he may be to improvements, must evidently, under such circumstances, see that he cannot bestow any extra labour upon his fields without being triply paid for; and it may therefore be hoped that, through the medium of the flax-culture, a more careful mode of agriculture and husbandry may insensibly creep into

Ireland, and ultimately be the means of a general reformation in the rotations of crops and a modern system of agriculture.

On every occasion I have strongly demonstrated to the Secretary, Captain Skinner, the necessity of urging the agriculturist flax-growers to adopt a better preparation of their ground, being convinced that, without better draining and subsoiling, the other improvements in the flax industry will retrograde in proportion, and suffer in its march.

The speeches delivered by Lord Lurgan and Mr. Ross, M.P., at the Society's general meeting of 1842, will show how much interest the landed proprietors had already taken in the improvement of the flax culture in Ireland.

The Right Honourable Lord Lurgan, in taking the chair, said,—

"He did so with feelings of great happiness; and he assured the meeting that he felt it a high honour to be allowed to preside over them on that occasion, and also to preside over that great undertaking. That Society was still in its infancy; but when he read over the names—the list of landed proprietors, noblemen, gentlemen, farmers, and manufacturers in connection with it—he felt that the greatest man alive might feel proud of having his name enrolled amongst those who had taken a part in carrying out a scheme so very laudable. It was a practical and sensible scheme—one whose object was to benefit the country, to promote industry, and give employment to the working classes. (Hear, hear.) Though the time was, he conceived, past when it was necessary to point out the advantages of such a Society, yet he could not deny

himself the privilege of saying a few words on the subject. It had been stated, he believed, on that platform, that they were in the habit of importing no less a quantity than 80,000 tons of flax annually, and that no less a sum than from 5,000,000*l.* to 6,000,000*l.* were drained from the country to procure that supply. Now he was sure they would all agree with him that Ireland was not sufficiently wealthy to part with such a sum; but then the question arose, how were they to keep it amongst themselves? Why, it appeared on undoubted authority that their soil was at least as good as that of their competitors. In fact, Mr. Deman, the Belgian superintendent agriculturist, at once took the bull by the horns; for he told them that he had seen no land in Ireland, not even the worst, that was not capable of producing a good flax-crop, if industry and attention were brought into practical operation. (Hear, hear.) His Lordship proceeds further in urging the farmers to adopt a better mode of preparing their land for the culture of flax," &c. &c.

Mr. Ross, M.P., in the course of his speech at the same meeting, said,—

" If, as the Report of the Committee stated, they were unable to compete with foreigners in the growth of flax, and if, as they found that the country could produce it, how important, then, must be the advantage to the country their producing even a portion of the immense quantity of 80,000 tons they were now obliged to import; and if, at the same time, their soil and climate were superior to the growth of the article to that of those countries whose hostile tariffs were meeting us in every quarter; and if, according to Mr. Deman and other authorities, it only required some painstaking, and a right system of cultivation and management, to produce as good an article, and as much as would not only supply ourselves, but enable us to export it also, he trusted the public would not stand so far in their own light as not to embrace the opportunity this Society offered of effecting these great ends; and so to teach our continental neighbours a great

lesson on political economy. He was determined to give the subject his most earnest attention and consideration; and in future not only to be a speaker, but a worker with them in the promotion of the Society's interests."

The following is a passage taken from the Report of the Committee from the same annual meeting:—

"Mr. Deman, the technical instructor of the Flax Society, has now been sixteen months in the Society's employment; and having visited every district in the north, and made himself thoroughly conversant with the habits of the people, is since last Report more and more convinced that the grossest ignorance in the preparation of the land, rotation of cropping, and after-treatment of the flax-crop, alone prevent this country from producing, both in the qualities and quantities, crops for which the soil and climate seem to him better adapted than those of any country of Europe. Agriculture, especially amongst the small farmers, was so little understood in Ireland, compared to Belgium, that until the land be better drained, super-tilled, more laboured, and better cleansed from its weeds, flax could not be brought to great perfection in Ireland.

"The following opinion of Mr. Deman's qualifications, as given by one of the cleverest men in the flax trade, who is employed in the purchase of the article for the extensive house of Messrs. Marshall, of Leeds, together with a number of others, must prove most satisfactory to the public."

To enumerate here the numerous testimonies alluding to my humble services would be absurd, although it may throw some light upon several interesting subjects. They are given at some length in the Committee's Reports, which were printed and largely circulated.

XI.

The favourable State of Agriculture for the Flax-Culture in England.

Mr. Warnes, the famous Norfolk flax-grower, came to Belfast at the Flax Society's annual meeting in November, 1842, and through this circumstance became slightly acquainted with him. A society having been formed in Norfolk, in the beginning of 1843, to promote, or rather to introduce, the growth of flax, Mr. Warnes, acting as secretary to that Society, requested my humble services. The idea of coming over to England, together with Mr. Warnes's generous offer, induced me to accept the task; and after having terminated my engagement with the Irish Flax Society, I came to Norfolk in February, 1843, where I have exerted myself during three years to promote the flax culture. For the last few years I have constantly occupied myself in the promotion of the flax industry, and of late I have had the opportunity of visiting almost every extensive flax-grower in England. If, therefore, I advance something in support of the cultivation of flax in Great Britain, it is not without being fully convinced that this

country is in every respect suitable for the growth and preparation of the flax-plant.

England possesses great advantages over Ireland for the culture of flax, in consequence of her high state of agriculture compared with the neglectful state of agriculture of the latter country; and if the English agriculturist will but go to work with his usual energy, he will from the first year grow flax to at least the same perfection as they actually do in Ireland; and this owing to their slovenly and neglectful state of agriculture. The flax-plant, it is true, although a delicate plant, will grow in almost any soil, but with very unequal success; and, considering the merits of the flax-plant, it would be against the order of things if it could be grown so well in an indifferent cultivated as in a proper cultivated soil. It must not be concealed that the flax-plant, in order to grow to great perfection, requires a careful preparation of the soil, but the consequences of this extra trouble are nothing less than amelioration, pulverization, and fertilization of the land.* Moreover, since agriculture has assumed a more scientific character than formerly, the peculiarity connected with the culture of the flax-plant will not in any w y deter the enlightened agriculturist; on the contrary, it will only tend to

* The introduction of the flax-culture in the rotation of crops must indispensably lead to improvement in agriculture.

create a fresh impulse to evince some further scientific improvements or discoveries in agriculture; and if under the present system of agriculture, scientific aid can be successfully applied to almost any agricultural plant, it must do so tenfold to flax, there being scarcely any limits to the great display and development of art and science that can be attributed to that wonderful plant, and especially when considered under its agricultural as well as under its commercial forms. In short (*en résumé*), such is evidently proved by the great variation in its different qualities of raw productions. Peruse the Belgian flax-markets, and you there find flaxes from 30*l.* to 350*l.* per ton. In Irish flaxes the variation will be from 30*l.* to 150*l.* per ton.*

What must be the reason of the immense difference in the price of these flaxes? Of course it is in consequence of the different qualities. And from whence does this great difference in qualities result? The question is easily solved. In one instance, all that art and skill can suggest has been applied to the flax-plant;† in the other instance,

* The variation in the quality of all the produce of agricultural plants is very insignificant, compared with the produce of the flax-plant; for instance, when the best quality of wheat is 60*s.*, the worst is at least 40*s.* per quarter, and so it is in proportion with most other agricultural productions. It is therefore only upon the flax-plant that agricultural science can make such wonderful effect.

† 350*l.* was decidedly not obtained without having taken extra pains to secure so superior an article; but when so much can be

everything connected with the various processes of the plant has been neglected. This single illustration shows what considerable room there is for applying industrial genius (*génie industriel*) to this lucrative plant; and it is exactly because the flax assumes in its various forms so much merit in which art and skill can find infinite development, that its growth and preparations are so well adapted for England. Strange, that but few countries will acknowledge the necessity of coupling scientific knowledge with practical knowledge in agricultural matters, a notion being entertained that agriculture is so simple in all its bearings that it does not require scientific aid: let therefore the agriculturist of this country teach our continental neighbours a lesson in agricultural science, and in accomplishing such the flax-plant can be instrumental in it to a great extent.

If ever there was a time when all those who lived by agriculture were called on to pay particular attention to it, and if there was one branch more than another that should engage our minds, that was the time and flax the branch.

Looking for a moment at the flax industry en-

gained by art and skill upon the raw material, what must be gained through the same medium upon the texture fabric? The difference, indeed, between a coarse rope and yarn worth 2000 francs per lb. is great, but still greater is the difference between a yard of coarse linen and a yard of the best Brussels lace; and yet all these articles are the production of the flax-plant.

tirely in a national point of view—what would be the situation of this country in the event of a war breaking out with those nations that supply us at present with flax? and if their ports should just now be closed against us, the results would be most disastrous to our flax spinners and linen manufacturers.

XII.

Exhaustation of the Flax-Plant.

Formerly, when flax was grown in England and Scotland, it appears that before it was pulled it had attained the same degree of maturity as wheat or any other cereal crop. If the flax was exclusively grown for nothing but the seed, of course it was a seed-crop; and it was in the interest of the grower to have it ripened till it had attained its last degree of maturity. I quite agree that flax when grown for a seed-crop is at least as exhausting as (colza) rape, and it is an established fact that most all agricultural seed-crops are more exhausting than cereal crops; if, therefore, the flax be grown solely for the seed, it must be ranked amongst the seed-crops, and as such it is decidedly more exhausting than any cereal crop. It is well known that all plants are more or less exhaustive to the soil; but to give some idea of the different degrees of exhaustation caused by the various agricultural plants which enter in the common rotation of crops, it may be laid down as a rule (however not without exception) that green crops are less exhaustive than

cereal crops, and that cereal crops are less exhaustive than seed-crops. My method of growing flax is to pull it green,* consequently consider it as a green crop, and is therefore the least exhaustive in the rotation of crops.. If flax be grown for fibre and for seed, but with a view to make so much of the seed than of the fibre, its exhaustation must be considered like that of a wheat-crop; but if flax be cultivated solely for the seed, it becomes undoubtedly an exhaustive crop, at least so exhaustive as (colza) rape, which is considered the most exhaustive among the seed-crops. The flax-plant, therefore, assumes the two extreme degrees of exhaustation ; in the one instance it is the least exhaustive plant, in the other instance it is the most exhaustive of plants.

Writers on flax all endeavour to prove that flax is not a very exhaustive crop, but none seem to attempt to show the degrees of exhaustation caused by the different modes in which the plant is cultivated.

The following opinion respecting the exhaustation of the flax-plant is given by an Irish gentleman farmer of considerable experience. He says, " As the result of many years' experience I consider that flax when grown in its regular rotation is far from being exhaustive, and that it tends

* When I say green pulling, it is from 12 to 16 days before it is quite ripe.

greatly to improve the soil and the character of the other crops in the rotation."

Lord Monteagle, at the council meeting of the Royal Agricultural Society on the 26th of February, 1851, states "That some of the land where flax had been sown had been previously in an exhausted condition; but by attention to the cultivation of the flax-crop that land had become better than any other on his estate;" adding, "that no meadow yielded such excellent grass as the soil on which flax had been grown."

The foregoing observations by two Irish gentlemen are very justly made, and it is almost my constant motto that the flax-culture must necessarily cleanse and improve the soil, inasmuch as it requires more tillage and subsoiling for flax than for any other crop, and is therefore a powerful medium by which improvements may be introduced in agriculture. Flax is pulled in Ireland rather in a green state, and is consequently but little exhaustive to the soil, the seed being not an object worthy of the attention of the Irish agriculturist.*

* It must be exceedingly strange to the reader, whether acquainted with the flax-culture or not, to find that in one country (England) the flax-plant is almost exclusively grown for the seed, and in another country (Ireland) that the seed is thrown away, although it is worth at least 4*l.* per acre; consequently, that it causes to the latter country annually a waste of national wealth of at least 240,000*l.* Besides this immense loss, it causes a great annoyance to the public.

Mr. Digby Seymour, in his work, 'Beet-Sugar, Flax, and Chicory,' quotes my opinion on the subject, and says:—

"There has been and there still exists, says Mr. Deman, a prejudice against the cultivation of the flax, a prevalent idea being entertained that it is an exhausting crop; but since flax (to secure a fine silky fibre) should be taken from the land (pulled) in a very green state, it follows that flax can only be considered as a green crop; and as the preparation for the flax requires more ploughing, subsoiling, and cleansing than for any other crop, it consequently becomes a fact that the growth of flax, instead of exhausting, cleanses and fertilises the soil.

"In Belgium a better wheat-crop is obtained after flax than after any other crop.

"Besides, there is no crop that comes to maturity in a shorter period than flax, it being sown in April and pulled in the latter part of June, and thus with the aid of a small quantity of liquid manure a crop of turnips is obtained the same season; a strong proof that the soil has not been exhausted by the flax. Moreover, the land will improve by bringing flax in the rotation of crops, as the soil cannot be cultivated by too great a variety of productive and useful plants."*

Flax cultivated on my system improves the soil, and produces a remunerative price, which no other plant whatever can produce; yet there appears to be some objection to pulling the flax-plant rather green, in consequence of losing in so doing a little seed, the English flax-grower feeling always inclined towards the seed; but recollect, that whatever is gained upon the seed by leaving the flax-plant stand longer than is re-

* 'Flax: its Cultivation and Management,' pp. 11, 12.

quired for the benefit of the fibre,* is more than lost by the extra exhaustation during that time, because the more the flax-plant approaches to its maturity, the more powerful becomes the exhaustation of the plant. But the objection brought forward again is, that, in pulling the flax so early, there is but a small produce of seed, and consequently little or nothing can be returned to the soil. Strange calculation indeed! Which is preferable, an acre of flax worth 20*l.*, with little or no seed;† or an acre of flax, the straw of which is worth 6*l.* and the seed 6*l.*, making together 12*l.*? Now, if the flax-grower cannot go on without flax-seed, let him take 6*l.* to purchase seed from the acre grown for the fibre, and thus he will have the same quantity of seed,‡ besides 14*l.* for his pocket; recollecting at the same time, again, that the acre grown for the fibre has but in the slightest degree exhausted the soil, whereas the acre grown for seed and fibre draws as much from the soil as a wheat-crop.

* By leaving the flax-plant a few days too long in the soil, 6*l.* per acre can be lost upon the fibre.

† When I say no seed, I mean that the Belgian flax-grower does not much depend on what he can make of the seed, although the seed is always worth from 1*l.* to 3*l.* per acre, except when Lin ramé; in this case the seed is entirely sacrificed. But then an acre of flax is by chance worth from 50*l.* to 60*l.* per acre.

‡ The foreign seed may not be so good for cattle food as the home grown, as I must confess that I never saw heavier flax seed in my life than the English growth; but in this case let the farmer purchase for 7*l.* or 8*l.* of foreign seed to make up for the inferiority.

After what I have said of growing flax for the seed alone, it should now be left as a question disposed of, feeling satisfied that my demonstration against this mode of growing the flax-plant would fully suffice to convince the flax-grower of its being a very exhausting crop, besides not being a remunerative one. But before leaving the serious question to the appreciation of the agricultural public, I must quote the opinion of a few others on the subject. A passage from Chevalier Claussen's work, 'The Flax Movement,' is as follows:—

"In the case in which he may elect to dispose of his flax in the straw, the farmer would derive the full value of his crop-seed, and the straw would be worth to him 4*l.* per ton, the produce being about two tons per statute acre. He will not require, as is the case at present, to pull his flax before it is perfectly ripe, or before the seed has been fully and completely formed. Indeed the coarser and more developed is the stem of the plant, the more valuable will it be for the purpose of adaptation for the woollen and cotton machinery, and the full gossamer threads can be produced from it with greater certainty and precision than when pulled in an early stage of its growth. The grower, therefore, need be under no fear as to the fineness of his crop, and he may obtain from it as large an amount of seed as his land will produce."*

* The Chevalier would, in my opinion, better not meddle with the flax-plant in its agricultural forms; he would find it perhaps more profitable to keep himself in the cottonizing department, that being his invention. Mr. Claussen can purchase tow in Ireland at 12*l.* per ton, which he can convert into flax-cotton worth, according to his statement, from 35*l.* to 40*l.* per ton; in this respect, and for the conversion of very inferior qualities of flax into cotton, Mr. Claussen's invention is of the greatest merit.

Agriculture in England will readily admit in her rotations of crops those crops to which scientific aid can be most extensively and profitably applied; but the resources for manure are yet too limited in this country for introducing with advantage very exhaustive crops, such as the flax-plant, when grown solely as a seed-crop.

The Chevalier Claussen, in another page of his work, 'The Flax Movement,' writes as follows :—

"A very general belief appears to prevail amongst our agriculturists that flax is an exceedingly exhaustive crop. The opinion is one which has been handed down almost from time immemorial, and the clauses which in many cases are introduced into the agreements and leases for agricultural tenancy, forbidding the culture of flax, hemp, and woad, have no doubt tended to strengthen this conviction in the minds of those who have not possessed the opportunity of practically testing the truth of the very current opinion. It is most undoubtedly true that flax in itself, like all other crops whether cereal or other, is certainly an exhaustive one. Few crops are, however, more exhaustive than wheat; but the farmer does not refuse to grow it on that account, as he knows that a great portion of the crop is usually returned to the soil. Now there are two modes of testing the accuracy of the opinion with respect to the injurious effect of the flax-crop, viz., by chemical analyses of the constituents of the plant, and by that still more satisfactory and convicting test—the result of practical experience.* Tried by either or both of

* Practical experience has proved to me that flax is an exhaustive crop when grown solely for seed, and nobody will make me believe the contrary. I cannot do justice to my task without giving a straightforward and impartial opinion upon the different modes connected with the growth and preparation of the flax-plant; and therefore trust that, in so doing, it will not for a moment be supposed that I am guided by any interest or personal feelings.

those it will be found, under a judicious mode of treatment, analogous to that pursued by the grower with respect to his other crops, that flax, so far from being an injurious, will be found to be, independently of its other advantages, of greater value than any other crops in keeping the land in a profitable state of productiveness, and preventing the possibility of its deterioration.

"If the construction of the plant be closely examined, it will be found that those portions of it which absorb the alkalies and the nutritive properties of the soil, are those which are not required for the purpose of manufacture, viz., the woody part of the plant, the resinous matter, and the seed. The capsules of the seeds, the husks of the capsules, and the seeds, contain a very large proportion of nitrogen and phosphoric acid, and may consequently be advantageously employed for the purpose of manure and for the feeding of cattle. The fibre of the plant, which is that portion required for manufactures, consists of about 47 parts of carbon in 100, united to the elements of water—in fact, oxygen, hydrogen, and carbon are its principal constituent parts, and they are derived not from the soil but from the atmosphere. 100 lbs. of flax fibre has been found by recent experiments to contain not more upon an average than 2 lbs. of mineral matters, including lime, magnesia, oxide of iron, carbonic, phosphoric, and sulphuric acids, and silica."

Mr. G. Nicholls, who has also written on flax in a work 'The Farmer,' says:—

"It has often been said that flax was a very exhausting crop, but it certainly is not more so than any of the usual grain-crops, neither does it require a very rich soil. Indeed, a rich or highly manured soil is injurious, causing the plant to grow too strong and luxuriant, and rendering the fibre coarse and less valuable. Flax is grown on light poor land in Belgium and Holland, and I have seen it grown on mere bog in Ireland."

I must give credit to Mr. Nicholls for his just

remark respecting the exhaustation of the soil by the flax-plant. The soil is decidedly not exhausted in Belgium and Holland, because there the flax is pulled before the plant is in its full vigour of exhaustation.

Sir R. Kine observes:—

"The agriculturist should steadily bear in mind that the fibre which he sells to the flax-spinner has taken nothing from the soil. All that the crop took out of the soil, he has still in the steep water and in the chaff of the scutched flax, and if after suitable decomposition these be returned to the land, the fertility of the latter will be restored, and thus materials at present utterly neglected, and even a source of inconvenience, may be converted into a most valuable manure."

Whatever the opinion of others may be on the subject of Exhaustation, my long and practical experience has proved to me that the flax-plant causes in the soil different degrees of exhaustation in proportion to its mode of cultivation. Of the three modes of cultivating the flax-plant, two modes I recommend; the third I deprecate without reserve.* The mode I recommend most strongly is to grow the plant on the modern Belgian method, that is, to let the plant ripen to a certain degree without injuring the fibre.† This mode of cultivating the flax-plant is better adapted for England than for any other country; and a few fair experiments would soon induce the English flax-

* Growing the flax as a seed crop alone.

† Trying to favour the seed as much as possible without injury at all to the fibre.

grower to give this method the preference. However, I am quite aware that for a commencement the second best mode of growing this plant will better please the English agriculturist, fibre and seed being the object of this mode. To conclude the question of exhaustation, let me again assure the agricultural public, that growing the flax-plant on the modern Belgian method is the least exhaustive of plants, and to grow it for fibre and seed is not more exhaustive than a common corn-crop. Let, therefore, without hesitation enter this plant into the rotation of crops in this country, with the assurance that its introduction is the introduction, under present circumstances, of the most essential and beneficial improvement which modern agriculture can suggest.

XIII.

*Suggestions for facilitating, promoting, and improving the Flax Industry in England and Scotland.**

One great important advantage which facilitates the immediate introduction of the flax culture in this country is, that those preliminary preparations which are required in many other countries for cleansing the soil must not be in many instances resorted to in this country, since I am convinced from my own evidence that the land of every county that I have visited is in a state of culture fit to grow the flax to a very good perfection. Directions for the preparation of the soil, sowing the seed, &c., were shortly given by me last year in a pamphlet, 'Flax; its Cultivation and Management,' published by Mr. Ridgway, Piccadilly, and Mr. Effingham Wilson, Royal Exchange. However, I feel desirous to suggest here again the urgent necessity of having good

* What I say of England, with reference to flax, may in many instances be attributed to Scotland—with this difference, that most of what I say of England emanates from practical knowledge, having myself grown and manufactured flax in this country to some extent, a practice which I have not had in Scotland.

and cleansed sowing-seed. Nothing can be more neglectful than not to extract those numerous pernicious weed-seeds which are generally mixed with the foreign flax-seeds. In one hour's time one man will extract with a sieve all the weeds that are to be found in four bushels of flax-seed, yet it would perhaps require twenty days' work to extract these weeds out when once grown amongst the flax-crop; and this cannot be done without more or less injuring the tender flax-plant. I must confess I feel rather a delicacy in bringing such simple, evident things under notice, knowing the carefulness of the British agriculturist in such matters; yet whilst in Ireland, notwithstanding our demonstrating the injurious effect it made of not cleansing the flax-seed, it was seldom done.

For sowing, good Riga seed is the best; from this the plant grows generally longer and with more delicacy than from other seeds. I cannot say that Riga sowing-seed has yet been imported direct in this country, but as the growth of flax is yearly increasing, it is to be hoped that direct importation will take place shortly in those sorts of seeds. For the present season this seed could be had from Ireland or Belgium,* but this is not an economical market.

* At my arrival in Norfolk, in February 1843, I could not see any seed suitable for sowing, consequently I made every inquiry in

I cannot too much impress the urgent necessity of selecting good flax-seed for sowing, besides strongly recommending a very careful preparation of the soil, knowing that the success of a good quality of flax greatly depends upon laying good foundation; and it is but just that nothing should remain untouched by which the progress and success of this great enterprise may be retrograded or endangered; the more so, when seeing the earnest spirit and enterprise with which landlord and tenant seem to unite to accelerate its success. Undoubtedly the accomplishment of an object so very desirable as that of the cultivation of flax would be attended with the most salutary effect, by affording employment for an increased population, and materially lessening our dependence upon foreign countries; indeed, the mass of combinations and efforts daily displayed by men of almost all ranks evidently shows that the establishment of the culture and industry of flax is about to become one of the most profitable

London for Riga sowing linseed. There were quantities of foreign seed to be had, but no real Riga; I was, therefore, under the necessity of importing 40 barrels of Riga linseed from Belgium. This seed, I am happy to say, produced a very superior crop of flax, especially when compared with what had been grown before; the fact was that the fibre of what had been grown in the two preceding years was worth nothing, it having been grown as a seed-crop. Farmers in sowing one acre with Riga seed every year can provide sowing-seed for at least six or seven acres: the part of the crop intended for sowing-seed is allowed to ripen a little more than ordinary.

staple commodities of British agriculture and manufacture.

To this effect societies or associations are continually formed. Landlords are giving every inducement to their tenants to grow the plant; other individuals are preparing a market to the former for the article in its raw state (the straw). An invention to convert flax into cotton will alone create a market for 1,400,000 acres of flax (according to calculation); and in accumulating the different movements, it must decidedly give a strong impulse to the advocates of the cause, and accelerate its progress and success.

In pursuance of a circular signed by Mr. Matthew Brown, agent for Sir James Graham, a meeting was held on Monday, 12th January last, at the Graham's Arms, Longtown, Cumberland, for the purpose of taking into consideration the propriety of introducing the cultivation of the flax-crop into this district, and also to endeavour to come to some arrangement with Mr. Rome, of Carlisle, to secure the establishment of a flax-mill at Longtown. This circular was addressed more immediately to the tenantry of the Right Honourable Baronet, but many gentlemen from a distance attended who were interested in agricultural matters, and some of whom had considerable experience in the cultivation of flax.

Sir James Graham addressed the meeting at

some length. The modes of growing and disposing of the flax-crop he advocates are, with a few exceptions, those which I have for the last ten years recommended to be adopted in this country. Sir James Graham, after having made some remarks not immediately connected with the object of the meeting, proceeded in making some very just and valuable suggestions upon the advantages of the introduction of the flax-culture in that part of the country, and said :—

" It has been strongly forced upon me that the time had arrived when, with great advantage to the farmer, the cultivation of flax may be introduced into the rotation of our cropping in this neighbourhood (hear, hear). About three years ago I went to the north of Ireland, where I was trustee to a considerable estate, the property of my nephew, Lord Dufferin, in the neighbourhood of Belfast. It is impossible to travel in Ireland any length of time without being struck with the vast superiority of the people of Ulster as contrasted with the condition of the people of any other part of that country; and when you visit Belfast you are still more strongly impressed with the comparative ease, comfort, and wealth of the inhabitants of that particular district as contrasted with the condition of the population in any other part of Ireland; and if you investigate the cause you are at once convinced it is because Belfast is the seat of the linen-trade of that country, and because Ulster is much engaged in the cultivation of flax. To these circumstances the prosperity so remarkable in that district is to be traced (hear, hear). I investigated at the time what had been the progress of the cultivation of flax in that neighbourhood, and that increasing progress (for it is an increase which is progressive) is to be traced to the improvement in the manufacture of flax. While the conversion of flax when grown in the hands of the farmer by the rude pro-

cess of steeping in cold water*—some of the older of us may well remember that cold water steeping was once the only mode of converting the flax when grown into tow used in the manufacture of the article known to the farmer—while that process was in the hands of the farmer it was improperly done, but the progress of science and manufacturing skill had been brought to bear in that country as elsewhere, and there is now a process—I think it is a patent process—in the hands of the Messrs. Schenck, of Belfast, by which the flax is converted into tow readily and with comparative ease; and this warm water process has greatly increased the demand and improved the linen trade; and consequent upon that there is an increased demand for the raw material (hear, hear). It can hardly be believed that such was the improvidence of the Irish farmer that they were quite content to be satisfied with the profit of the straw and the fibre only when used for manufacturing purposes, without reference to the seed, which is the most important ingredient to them in its cultivation. I need not tell you that, independently of all manufacturing purposes, the seed is a valuable part, for when boiled it is the best food that can be given to cattle, and still more when converted into oil-cake; and not only is it the best food for cattle, but it ranks among the best manures that can be applied to the land (hear, hear). The effect of the double operations of convert-

* I cannot see why the cold water steeping should be called a rude way of steeping; it is decidedly by this method of steeping that the most costly flaxes are produced, from which the elegant and ornamental fabrics are manufactured; besides being the most superior, it is also the most economical method of steeping that exists. The great objection to this water-steeping in England is, because in Ireland the steeping causes some smell, which indeed is not very agreeable; but this is caused in consequence of throwing the seed in the water; it is the decomposition of the seed that brings forth this inconvenience. Such a thing is not to be met with on the banks of the Lys, in Belgium; on the contrary, the odour caused from the flax-plant is very pleasant and wholesome. A similar remark I have already made in another page respecting the annoyance caused by the steeping of the flax-seed in Ireland.

ing the fibre into flax by the new processes of Messrs. Schenck's warm water steeping, and the conversion of the seed into oil-cake, at Belfast, has led to the increased cultivation of flax, a more certain market to the farmer for his produce, and increased prosperity to that portion of Ireland (hear, hear). I naturally considered whether there was anything peculiar in the soil or climate of that particular portion of Ireland which gave it an advantage over the south of Scotland and that part of England which we inhabit, and deliberate considerations lead me to the conclusion that neither the soil nor climate was superior to ours (hear, hear). The softness or humidity of their climate is identical with our own. They have perhaps more rain, or at least an equal quantity of it, and their soil appears to me to be no better suited to the growth of the fibre than ours. This was about three years ago. I then thought it my duty to investigate the subject not only as connected with Ireland, but also to extend my inquiry to different parts of England (hear, hear). In the south also I found, pursuing my inquiries as far as Wiltshire, Essex, and into Wales, there was a strong impression that the time had arrived when the attention of the agriculturist must be directed to the growth of flax."

I do not agree with Sir James Graham when he says that it is owing to Schenck's patent hot-water steeping that the improvements of the linen manufacture in Ireland must be attributed; on the contrary, the linen manufacture would have done much better without flax steeped in hot water.

Ireland has many natural good water-streams in which they could steep on the Courtrai system, which renders the flax of a bright white colour, and is worth 50 per cent. more in the market

than the flax steeped on Schenck's patent system. Great improvements indeed have been made in Irish flax since the last ten years, but those improvements do not consist in the hot-water steeping, but in the introduction of modern modes, as well in the preparation of the soil as in all the after processes connected with the flax-plant; and the improvements thus made are owing to the establishment of the Belfast Flax Society. I recommend Schenck's steeping in England in some instances, but under no circumstances in Ireland, because the latter country possesses sufficient rivers and water-streams to steep 300,000 acres of flax, of which they ought to make use. The resources for industrial economy in flax are immense in Ireland, and the circumstances of that country require that they should be made profitable.

I agree with Sir James that there is great economy in extracting the oil from the flax-seed, and merely give the powder of the seed to the cattle; the oil can be used for a nobler purpose. This is practised in Belgium, and is considered a very careful and profitable branch of husbandry, much more economical than to give the linseed mixed with barley, such as is practised in this country.

I also quite agree that the Irish soil is not superior to British soil for the culture of the flax-plant, and as to the climate I should give the preference to England.

Sir James Graham, after having referred to a statement of some five acres of flax grown last year by Mr. Samuel Druce, of Eynsham, producing a net profit of 8*l.* 6*s.* 2*d.* per acre, continues saying:—

"Now I wish to call your attention to the remarkable coincidence between what is now in progress in agriculture generally as referable also to the inducement to couple that progress of agriculture with the growth of flax. Three great requisites are indispensable to its proper cultivation: the land must be dry, the land must be deep ploughed, and the land must be clean (hear, hear). Now you are all aware that, especially in this wet climate, we have discovered that surface-draining—by that I mean shallow draining—is an insufficient mode of draining—that deep draining is necessary in this district, and I am happy to say that great progress has latterly been made in such effectual deep draining. Then, again, that draining in itself has proved to be ineffectual unless with it is combined deep ploughing. Shallow ploughing is merely scratching the soil, whilst the land in reality remains as hard as a turnpike road, and the hard crust that remains is fatal to vegetation or the growth of the cereal crops. It is ineffectual, I say, unless that crust be thoroughly broken and pulverized. It is then quite clear that, as a general rule, independently of the growth of flax, effectual draining and deep ploughing are absolutely necessary (hear). That is in progress throughout the district, and the beneficial result is exemplified in the increased return of the produce of the soil. Then the potato-crop, I am grieved to say, has become an uncertain and precarious crop. There is also every reason to think that the present processes in the growth of wheat offers not the inducement it used to do, and the wetness of this climate is a great objection to its general cultivation. That is likewise common to Ireland. But that very humidity of climate, with deep draining and deep ploughing, is not incompatible with the successful cultivation of flax."

Sir James Graham most justly considers the introduction of the flax-culture in the rotation of crops as being in full harmony with the present required progress of improving the soil. It is gratifying to learn that landlords should have inquired and understood the great importance that must be attached to the proper preparation of the land intended for flax. I have not had the pleasure to visit any estates in Cumberland, but it appears from the remarks before me, and other practical information I have been favoured with, that the soil is rather stiff and wet in Cumberland. If so, it requires the more pulverizing and deep ploughing. The suggestions, therefore, made by the honourable speaker respecting the preparation of the land for flax-culture must be considered valuable to the farmer who intends to grow that plant.

Sir James Graham, in the course of his explanation, refers again to Schenck's system of hot water steeping, and says:—

"Schenck's system of steeping in hot water is carried out successfully in Ireland; and though manufacturers prefer the rich silky-like appearance peculiar to flax prepared on the old system to that prepared in the hot water, which looked dull and hairy like an old wig (I quote from a letter lately received from a manufacturer of many years' and very extensive experience), yet its ready sale and the good prices it fetched in the market, together with the increased breadth of flax grown this year, sufficiently prove the benefits arising from the introduction of this system."

Here it is said by the speaker that the manufacturer prefers the rich silky-like flax prepared by the cold-water steeping; that the hot-water steeped flax looks dull and hairy like an old wig. What does this prove? It proves from the account given by the manufacturer that the principle of hot-water steeping is to a great extent injurious to the texture fabrics made from such flaxes. If, therefore, the flax-spinner and linen manufacturer use it, it is because they cannot find their full supply of the flax steeped in the natural water. Notwithstanding its inferiority, I concur that the hot-water steeping is the means by which the flax-culture will be extended in England, and so long as it will pay the farmer to grow it for that purpose, it is his interest to do so; and it rests further with the manufacturer to know what his interests are.

Sir James Graham refers also to the discovery of Chevalier Claussen of converting flax into cotton, and says:—

"Mr. Claussen hopes by the conversion of flax-straw into what he calls 'flax-cotton,' two great results will be effected, namely, that the flax-cotton may be intermixed with foreign cotton in the manufacture of cotton goods, and still more that it may be intermixed with wool in the manufacture of woollen goods; so that the material of which a tweed coat or trousers are composed, which is now one shilling a pound, will not cost more than sixpence per pound, and the manufactured article will consequently be correspondingly cheaper (hear, hear). This would effect a diminution of price in the dearer

article, and an increased demand for the manufacture of clothing amongst the great body of the people (hear, hear). With regard to the admixture of flax with cotton I am not so sanguine on that point. The price of cotton is at present very low in the market, not more than sixpence per pound, and flax could not be manufactured at a less price; therefore the intermixture of the two would not be profitable to the manufacturer, whilst it would diminish the value of the cotton goods. With regard to wool I entertain more sanguine expectation (hear, hear). Although it is a very hopeful experiment if properly carried out, I by no means rely upon the success of this movement to show the value of the cultivation of flax,* but if successful it will be an inducement to others to follow our example. If we look at the great success which has attended it in Belgium, there is ample inducement for the cultivating of flax on a very extended scale in Great Britain and Ireland (hear)."

The views which the Honourable Baronet takes of the flax industry in this country are cautious and sound, besides well calculated to give a fair and just idea of its merits, and to prompt the agricultural public to set at work at once to try at least the experiment. In reality, in perusing the proceedings of this meeting, I find that everything that has been suggested, or is about to be settled, to induce the farmer to grow flax, is almost in every instance in harmony with my opinion respecting the general measures required for the introduction of the flax-culture in this country at large; and I cannot help therefore giving at some length the most interesting passage of what was ex-

* A very wise and cautious warning.

plained and stated on this occasion. At the same meeting at Langtown, Sir James Graham goes on saying:—

"In the course of my attendance at the meetings of the Agricultural Society of London I had opportunities of conversing with the great body of the gentry and farmers from the different parts of England; among others a friend of mine, Mr. Long, one of the members for Wiltshire, who has considerable property in North Wales. The soil and climate in North Wales are in no respect better than ours; it is very similar, but not superior. Mr. Long stated to me two years ago, which would be in 1850, that he grew flax for the first time in North Wales, and he gave me an account of the result of his first experiment there, which I will read to you:—'At the meeting of the Melksham Agricultural Society, held on the 2nd of December last, Mr. Long, M.P., in directing the attention of agriculturists to the cultivation of flax in that district, stated that he himself had had some little experience of it. He had grown it for two years in Wales. Last year he had made 10*l.* an acre of it, after paying all expenses. He had sold the produce of two acres for 30*l.*, the expenses against the crop being 10*l.* He had sold the straw for 3*l.* 10*s.* per ton to a firm in Bristol, who were ready to take several thousand tons at that price' (hear, hear). Encouraged by what I thought was a promising aspect with reference to the growth of flax, I myself tried a small experiment. I was not so fortunate in my first attempt as Mr. Long was, nor as I might have been. This (pointing to a sample-bag full of linseed) is the seed raised, and here (holding up the straw already mentioned) is some of the flax produced by that experiment. My profit, as stated, was 4*l.* 13*s.* per acre, a detailed account of which has already been in print, and I will not trouble you with those particulars again. I may state, however, that in that account nothing has been exaggerated, and everything has been brought to charge with the utmost care, taking in the price of the seed at 6*s.* per bushel, which was then the market price, though it is now 8*s.* per bushel.

The total produce amounted to 23*l.* 2*s.*, the cost of production to 13*l.* 4*s.*, leaving a total profit of 9*l.* 18*s.* To myself has resulted a profit on the experiment of last year of 4*l.* 13*s.* per acre (hear). I am quite satisfied I committed a mistake, and I could have greatly improved that crop with my present knowledge on the subject.—I failed to plough my land as deeply as I ought to have done. It was clean (it was after turnips), but I did not give the land that second furrow which it ought to have had ; and if I had, the quality of fibre would have been greatly improved and the quantity increased. I tried guano. That, I am satisfied, is an imprudent mode of treatment; it adds to the luxuriance of the crop, but weakens the fibre, which falls down and is injured. It increases the stimulus, and it is altogether unwise to add stimulants to the growth of flax (hear). There is no necessity for it, and should never be resorted to.* It has been said that flax is an exhausting crop, and great stress has been laid upon it on this point. Now I, as a landlord, cannot be supposed to wish to encourage the growth of any crop which would be permanently injurious to the land occupied by the farmer (hear, hear, and a laugh), and I would not wish to grow a crop if it impoverished the land (hear, hear). I do not wish to fetter those with whom I am connected with any stipulations whatever, but at present I should be perfectly willing that they should introduce flax into their rotation, either before or after the turnip-crop, only on condition that the quantity grown should not bear more than a fixed proportion to all the land under cultivation ; they should not grow more than five acres to the hundred (hear, hear, and applause). With that single reservation I should not be at all afraid to see my tenants sell their flax-straw from their ground (hear, hear, and cheers). I think I can give no more satisfactory proof of my sincere and conscientious belief that it is not an exhausting crop (hear, hear). As to the demand, it is hardly credible what is the increase of demand that may be expected if we calculate by comparison. What is the tendency of manufactures with refer-

* This is a very valuable remark.

ence to the linen trade in the spring of the year? For the eleven months of 1851 the almost incredible amount of 1,085,000 cwt. of flax was imported from foreign countries. The imports of flax-seed for the same period were 514,000 qrs., and oilcake 48,000 tons. This amount is a matter of certainty, but must be estimated according to the quality of the crop. What would be the real value of that 1,085,000 cwt.? As to the seed it would be about 64*s.* per qr., or 48*l.* a-ton for the 48,000 tons (hear, hear). With regard to oilcake it is very well known that with every precaution on the part of the buyer there is the greatest exposure to imposition according to the present system (hear, hear). In fact there is no article which the farmer uses in which there is a greater variation of quality than in oilcake, and to purchase it where the party who manufactures it is known to the farmer is of the greatest importance (hear, hear). If I measure these important items, the flax-seed and oilcake, in cash, I cannot put them down at less than eight millions of money which is paid to foreigners for these three articles in the course of eleven months in the year ending in 1851 (hear, hear). That is the state of the imports. Now let us look at our manufactures. In the year 1850 the exports amounted to 110,730,000 yards of manufactured linen. One would suppose that it was hardly possible there could be an increase upon that enormous quantity. But if we take the year 1851, we find that so far from there being any diminution, it rose in that year to 117,403,000, being an increase of 6,673,000 in eleven months (hear, hear). Let us see what is the total value of the linen manufactures exported from this country. The declared value of the linen manufacture exported in the year 1850 was 3,579,000*l.*; in 1851 3,750,000*l.*; being an increase in eleven months of 171,000 (hear). What was the amount of the linen yarn exported within the same period of 1850? It was 16,700,000 lbs. in weight, the value being 816,101*l.*; for the eleven months of 1851, 16,975,000 lbs.; value 863,441*l.*, being an increase of 275,000 lbs. in weight, and 27,340*l.* in value. To meet this consumption, both for home use as tested by import and a large amount exported,

the estimated growth is at least 700,000 acres, and we have a perfect knowledge that in Great Britain and Ireland not more than 150,000 acres of flax are cultivated (hear, hear). Therefore, even with the present demand for the raw material, we may with safety add 600,000 acres of land under the plough for the growth of flax (hear, hear). I have told you the opinions of strangers. Now hear a gentleman whose letter I believe I am at liberty to use, though it is addressed to Mr. Rome. He combines the double character of heir to a great agricultural estate and proprietor of a large manufacturing concern as a flax-spinner; I allude to the eldest son of Sir Wastell Brisco, a great landed proprietor in this country (hear, hear). I will read to you shortly extracts from his letter. He says, in answer to some inquiries of Mr. Rome's:—

"'It is out of my power to inform you what was the quantity produced per acre, as I have not yet scutched it all, and the crop was made so various by numbers of experiments tried in small quantities, that the result would be of little value for your object, even had it all been scutched. I found, among other things, that so small a quantity as 1 cwt. of guano to the acre very much reduced the money value of the fibre, though it appeared to increase the weight of the crop on the ground. The inferior quality I sold at 47*l.* per ton; for the best I was offered 120*l.* per ton, but as it was only a small quantity from a small experiment, of course I made no sale.'

"Now, I would not recommend the farmer in the first instance to grow with reference to the quality of the fibre.

"That is a question requiring very peculiar skill and scientific knowledge, and until there be experience I do not think he can safely anticipate the growth of very fine fibre. You can alone ascertain the difference in the quality of the fibre by experience. As Mr. Brisco states very truly, it ranges from 40*l.* to 120*l.* per ton, thereby affording the farmer a large margin for increased skill and application to cultivation of superior flax, when he can command such a large price if he be judicious in the selection of his soil, and careful in the cultivation of his crop (hear, hear). But Mr. Brisco goes on

to say :—'The result of my experiments brought my mind to the conclusion, generally, that we can grow flax in Cumberland of very fine quality, varying with soil and management; that the fibre and seed will yield more profit than any grain-crop, that it may probably on every soil for fibre, except poor gravel and sand.' "

"In which opinion I agree with him, and differ from the Essex farmer with regard to gravel and sand, and Mr. Brisco continues—'That on the latter soil it may be grown as a seed-crop only, to yield more profit than any grain-crop; that it is the best crop to show grass and clover seed with; that such grasses have all the appearance of an old pasture on dry land (I mean not to compare with an old meadow); that after the flax is pulled you get more feed that autumn than from the aftermath of seeds with wheat the second year; that seeds sown with flax give a greater produce the next year by double than if they had been sown with wheat or barley; that the immense gathering obtained from seeds the same year they are sown, and after the flax is pulled, should be added to the value of the crop.' "

Flax will grow on gravels and sands, but the quality and quantity will be less advantageous than when grown in better soils. Flax will grow on soils where nothing else can be grown, and if flax should be grown at all for the seed only, or on speculation to sell the fibre to the cottonizers, let it be grown on such soils. While in Norfolk, Mr. Marsham, of Stratton Strawless, grew three acres of flax on broom-land. The first crop after the land was brought into cultivation was oats, but were not worth harvesting; the second year was tried with flax; for this flax I offered 15*l.* for the straw of the three acres, but Mr. Marsham having fine water-streams for steeping, I advised to pre-

pare it himself for the market, from the fibre of which he made 19*l.*, all expenses deducted, and from the seed 10*l.*—together, 29*l.* This was grown on land where nothing else could be grown.

Clover, grass, and carrots cannot be recommended to be sown with flax; when the crop is solely cultivated for fibre, it gives in wet seasons an impure colour to the lower part of the plant; but when the crop is grown for fibre and seed, it is then of less consequence to the fibre, and certain it is that clover and grass will thrive better when sown with flax-seed than with any other crop. The Flemish farmer, although he knows that it is in many cases injurious to the fibre to sow other seed with the flax-seed, can often not help doing so, for the sake of securing a good clover crop. I have often seen clover mown in the latter part of September from two feet long.* It should be recollected that either half a crop of clover, turnips, or carrots, is generally obtained in Flanders after the flax harvest, and what is obtained there can be obtained here with proper management, and this undoubtedly must add materially to the value of the flax crop.

The Honourable Baronet continues—

"And I may state that in the best sample of flax grown by me I did accompany it with sowing out with it grass seeds,

* It is understood that this was the season the flax had been grown. I call this half a crop, because they have always two or three good cuts of clover in a season.

and I agree with Mr. Brisco, that I never saw flax so well grown as when those seeds were sown with that crop.

"Thus I have stated briefly my candid opinion and belief of the flax crop. I shall now give you my view of the crop as applied to the general introduction of it into Cumberland. My father was wishful to introduce it among his tenantry, they also applied to me for my opinion and advice. Having some time previously weighed it carefully over, as a grower and a spinner, and my family being possessed of large landed property, I came to this conclusion—that to grow flax for fibre profitably, it must be viewed as a scientific crop; but to grow it for seed reduced it to merely an agricultural crop. Our farmers, not knowing the nature of the plant, or even the appearance of it, could not possibly have a chance of growing it when great skill and experience were required, both in the masters and hands. My advice, therefore, was, let it be grown as a seed-crop only * till they become acquainted with the nature of it, and what lands and management suit best; if by this method they fail to grow it in the best way, it yet will pay them as well as another crop. By this means it will become familiar to them; they will adopt it as a friendly crop of their own, after which they may be drawn on to experiment in a small way for fibre when a failure will not hurt them.'

"There is one other passage which I should like to read to you from this very sensible letter. He now speaks as a manufacturer:—'We flax spinners, as a body, see the necessity of having flax grown in England, and are determined to push it forward: as a landed proprietor as well as a spinner, I see we must grow it; of all crops it is the one to save us. We must make an exchange with the foreigner, and as he has taken our wheat crop from us, because he can grow it cheaper, we likewise must take the flax crop from them, because we can grow it cheaper, and which, as far as value is concerned, will balance the account.'

"This letter I have read to you exactly in the terms in

* I expect that Mr. Brisco means fibre and seed.

which it is written, and it contains the opinion of a gentleman who is intimately concerned in the land of Cumberland, and, as I have already stated, honourably connected with the manufacture of this very article (applause). I don't wish to encumber my statement with any unnecessary details. I felt that it was of the utmost importance to you, under these circumstances, to introduce the cultivation of flax in your rotations of crops; it is what I shall do in reference to the land which I farm myself, and my firm conviction is that its general adoption will be most advantageous to both owner and occupier (hear, hear). The difficulty is where to find a manufacturer in the immediate neighbourhood of the grower who will undertake the purchase and conversion of the seed into oilcake, and of the straw into fibre (hear). I told you that I, for one, would not have any concern in a joint stock affair of this kind, nor would I recommend the farmer to become speculative to that extent (hear, hear). It is enough for them to grow the raw material. But when I felt it was due to caution the farmer upon this point, I inquired in my own immediate neighbourhood whether there was any gentleman of spirit, skill, capital, and enterprise ready to undertake the experiment (hear, hear). Well, gentlemen, the result was that in Mr. Rome I found what I sought for, and he expressed himself perfectly willing to undertake the enterprise if the growers would give him some encouragement (hear, hear, and applause). I said to him at the same time, 'Now, don't be rash, don't do anything without looking well what you are about, and calculating all the chances of success.' I advised him to go to Ireland and learn what was going on there. I said, 'I will give you the best introductions you can have with regard to opportunities of seeing the growth and manufacture of flax. I am not unknown there, and every facility will be afforded you of acquiring all the information you can possibly obtain; and, moreover, if you like to go, my agent, Mr. Brown, will accompany you (applause). You shall visit my friend, the agent for the Duke of Hamilton, who has to deal with a wetter climate than our own, and you shall hear what he has to say about the cultivation of flax in

Scotland; you shall then go on to Ireland and see what I saw in Belfast, and in the neighbourhood of the counties of Down and Antrim.' I said politics had nothing to do with this, and on that point I will ask what is the case in the north of Scotland? In Glasgow a Society has been formed which has the cordial support of the Duke of Montrose and the Duke of Hamilton, who are diametrically opposed to each other in political matters, and by all the merchants of Glasgow, thinking that they had a common interest in introducing that which was profitable to the land of the United Kingdom, and in improving the growth of flax as an article of our manufacture (hear, hear). Mr. Rome went accordingly, and returned home very much confirmed in his previous opinion that there was so much superiority in the mode adopted by Belgium and in Ireland, that he was not unwilling to proceed at once, if the growers of this neighbourhood will only give him some certainty with regard to the supply of the raw material (hear and applause). Hearing this, I naturally wrote off to my two great neighbours, all powerful on each side of the border, Lord Carlisle and the Duke of Buccleuch, to learn what they had to say on the subject. They were of my opinion, that if this cultivation could be introduced with the aid of a couple of manufactories, independent of the land, it was a great opportunity which ought not to be neglected."

Really, the steps taken by the honourable baronet to accelerate and establish the flax culture upon firm footing in Cumberland are of a most energetical and decisive nature, and if acted upon by a few leading landed proprietors in each county the flax-culture would be for ever established all over Great Britain, and in the course of a few years this would have become an exporting instead of an importing flax

country.* But, as I have already observed, without establishing the flax factorship, and thus preparing a market for the farmer's flax-straw, the flax-culture will never become general in England. It is therefore to be hoped that, where the way is now so clearly traced, the agriculturists will not stand so much in their own light as to let this favourable opportunity escape without taking advantage of those great facilities given to them. The flax-culture, under present circumstances, cannot any longer be objected to on the ground of not having a market for the article, or of being a troublesome crop, because, since the farmer can dispose of his flax in the green state, it is the least troublesome plant that can enter in the rotation of crops.

The farmer has but to grow the plant to the utmost perfection that good culture, the particularities of his soil, seed, and season will admit of, and everything respecting the flax crop is over for him; it must therefore be said that, when the seed is sown in April, the farmer has nothing

* It is satisfactory to state that many large landed proprietors have taken the flax-culture under their earnest and serious consideration. Last season I had a short interview on the subject with the Duke of Richmond, the Earl of Willoughby d'Eresby, the Earl Zetland, Lord Sondes, the Earl Chichester, the Agent of the Duke of Sutherland, Lord Faversham, Lord Walsingham, Lord Kinnaird, Lord Colborne, and others, all of whom were about to try some experiments. The Earl of Talbot and Lieut.-General Kirrison, whose estates I had the pleasure to visit, were large growers last season.

more to look for except to receive the amount of his crop in the latter part of July. Can so much be said from any other crop?

Sir James Graham, after having made some remarks and suggestions of less importance, refers to a letter from the Messrs. Marshall, of Leeds, the extensive flax spinners. It appears from this letter that the farmers near Patrington are now growing flax on their own account, and sell the crop to the Messrs. Marshall, when ready for pulling, at from 7*l.* to 11*l.* per acre; but to introduce the flax-culture in that part of the country, the Messrs. Marshall were at the first outset obliged to take the land from the farmers at a price, and take the whole management of the crop upon themselves, but it seems that the farmers at present have come to better senses. As the agriculturists in this country will always attach much price to their seed and trash, it would be more profitable for them to have the seed taken off on their own premises; then they would have their own husks, chaff, and leaves, all of which can be economically used on the farm;* when the farmer cannot find a favourable

* The flax-seed should decidedly be kept by the farmer, it being much more valuable to him than to the party that purchases the straw, it being nothing but an incumbrance to the latter; besides, the farmer can more economically use the husks, the chaff, and leaves of the plant, it being a most valuable manure for clover and grass; nobody without trying can form an idea of what rapid

market in the green state: the flax afterwards is to be disposed of by weight; the present average price is from 2*l.* 10*s.* to 4*l.* per ton; the average weight is 2 tons per English acre.

Sir James Graham then read the following statement of the cost of production and value of 2 acres and 20 perches of flax grown on Crofthead last year:—

"*Cost of Production and Value of* 2 *acres* 20 *perches of Flax on Crofthead Farm.—Season* 1851.

Produce.	£.	*s.*	*d.*
To 38 bushels of seed at 6*s.* per bushel . .	11	8	0
3 tons 18 cwt. of straw at 60*s.* per ton . .	11	14	0
	23	2	0
Cost.			
By two ploughings, harrowing, sowing, rolling, &c., at 16*s.* per acre	1	14	6
6 bushels of seed at 10*s.* per bushel . .	3	0	0
Weeding, cost 9*s.* 8*d.* per acre . . .	1	0	0
Pulling, harvesting, thatching, &c., cost 21*s.* per acre	2	4	6
Rent of land, rates, &c., 26*s.* per acre . .	2	16	0
	10	15	0
Housing and thrashing seed at 12*s.* per acre .	1	5	6
Carriage of straw to Carlisle at 6*s.* per ton .	1	3	6
	13	4	0

Produce	23	2	0
Cost	13	4	0
Net profit .	£9	18	0

Profit 4*l.* 13*s.* per acre."

effect this refuse makes upon the growth of grass and clover. In Belgium, although the farmer sells his flax crop green on the field, he nevertheless keeps the seed to himself.

Sir James said that he had committed two mistakes in trying the experiment; first, he had grown it after turnips, and the land had only had one ploughing, and not a deep one.

If such a quality of flax can be grown on turnip land having only had one ploughing, and not a deep one, what will be the consequence when the plant will be grown on the proper land, and shall have had all the pulverization and fertilization required?

Agriculturists, the suggestions, statements, and facts just laid before you, respecting the flax-culture, are decidedly of the most encouraging nature, and cannot fail to inspire you with confidence in the future success of the flax cultivation.

XIV.

The Flax-Plant in a Social and Moral Point of View.

I have said that the flax-plant possesses also incalculable advantages when considered in a social and moral point of view, and will give a few extracts from good authority in support of my advancement.

At the annual meeting of the Royal Flax Society in Belfast in November, 1846, Mr. Sharman Crawford, M.P., in moving the adoption of the report, made the following remarks:—

"It will be desirable now to consider what the resources of the country will admit of, and to take a review of the production of flax, which may be created from the lands of Ireland, properly managed on a rotation system. In the report of the Commissioners for the return of the population they found that the portions of the land of Ireland fit for the purposes of agriculture, exclusive of all other descriptions, amount to 13,464,320 acres. Instead of one-eighth, which has been shown is perfectly consistent with good farming, let us suppose only one-sixteenth appropriated to flax, we should have 841,518 acres. 6 cwt., or about one-third of a ton, is considered a fair average produce by the acre; that would give no less than 252,455 tons, and, at 45*l.* per ton, the value would be 11,360,475*l.*; then, with regard to the employment which the cultivation of the plant gives, and which is a most important consideration, it has been shown

that, independently of spinning, an acre of fine flax gives employment for a year to nineteen persons in manufacturing it into pocket handkerchiefs; and, if spinners be added, there would be an addition of forty-four women, making altogether sixty-three persons.

"But some people may think that an exaggerated statement; therefore, let it be supposed that one acre of flax would be equal to the employment and support of one family for the year; then the result would be, supposing that one-sixteenth only of the lands of Ireland to be in flax, there would be 841,518 families so supported; and taking each family at the usual average of five, the number of individuals sustained would be 4,207,590, equal to about one-half of the whole population of Ireland. Let us consider in how small a degree the manufacture of flax has hitherto advanced, and then look at the means and capabilities of Ireland—the immense water-power, for instance, which was wasted. But I hope that there will be a change that will induce the men of Ireland to look to the water-power, for, if they do, the remunerative prices of flax will be greatly increased.

"Mr. William Blakely, a tenant of the Dean of Dromore, in the townland of Coreelany, near Waringstown, grew last season (1843) three statute acres (about 1 acre 3 roods 16 poles Irish measure) of flax, which he managed strictly according to the directions of the Society for the Promotion and Improvement of the Growth of Flax in Ireland. The produce of this field has been recently purchased at 15*s*. per stone by Messrs. M'Murray and Henning, of Waringstown, the eminent cambric manufacturers, who say it is equal, if not superior, to any flax they ever saw before, and that they have given 36*s*. per stone for foreign flax of an inferior quality.

"A large portion of this flax has been delivered to Messrs. M'Murray and Co., but some still remains to be dressed by the celebrated machinery of Mr. Henry, of Keady. Should this part be as productive as that already furnished, the entire produce of the three acres will be 120 stone, which at 15*s*. will give to the farmer 90*l*.; but he has a certainty of 100 stone, which will realise him 75*l*.

"This flax is now in process of conversion into cambric pocket handkerchiefs; it is capable of being spun to thirty hanks to the pound, and is to be spun by hand. Mark, now, the employment this will give.

"It will give constant employment, for twelve months, to 158 women to spin it; 18 weavers will be occupied a like period in weaving; and it will employ 40 women for a year to hemstitch (or vein) the handkerchiefs, thus giving constant employment for twelve months to 210 persons.

"It is curious to trace the result of the process which this flax is now undergoing; it will produce 210 webs of cambric, each web containing five dozen handkerchiefs; each dozen will be worth 50*s*., and the entire when finished will be worth 2600*l*."

However much the production of an acre of flax, when manufactured in superior Irish fabrics, may appear, it is not to be compared with the superior productions of the Belgian and French fabrics. A fact which I have already mentioned, and can be proved, is, that one acre of flax of extraordinary fineness and quality has produced in some instances from 20,000*l*. to 30,000*l*., when converted into Brussels lace called Dentelles Point Bruxelles, travaillées à la main, en fil de lin, and other superior articles. The social and moral benefits the flax and linen manufacture have made in East and West Flanders during the last twenty years, and especially during the last few years, are incalculable. My native village is actually enjoying the most happy and beneficial results from the manufacture of mouchoirs, batistes, linons, and toiles, established a few years since at Wevelghem, near Courtrai, by my friend,

M. Van Ackere. The articles exhibited by him at the London Great Exhibition were much admired by all competent judges, and to which the jury has awarded an honourable mention. Indeed, this precious branch of industry should not be lost sight of, the more so because the flax-spinning machinery can only, up to the present day, spin No. 260, whilst the finest yarns spun by hand for the superior Brussels lace are No. 1200 (dévidés à l'Anglaise); thus, that this yarn is about five times as fine as that produced by machinery. We all know that the hand-spinning is totally superseded by the machinery, except for those lucrative articles the demand for which has considerably increased for the last few years; and it is not likely that machinery will ever be brought to such perfection as to spin those very fine numbers of yarns, and, therefore, this branch of industry will ever be precious, and continue to provide employment of the most genteel description for the more delicate sex. Indeed, the making of lace is one of the most elegant and remunerative occupations that a female can perform. Such a branch of precious industry ought to be introduced in England (on the same footing as it exists in France and Belgium), where thousands of females are in want of genteel and delicate employment. This would no doubt contribute in creating comfort and social and moral benefits.

The following fact is a fair specimen of the

beneficial effect which the flax industry has already made upon morality and social comfort through the exertions of Mr. Warnes.

Chevalier Claussens, in his pamphlet 'Flax Movement,' says,—

"One word upon the social advantages which must result from an extended cultivation of flax, and my remarks will have been brought to a close. Upon this point I cannot do better than quote a few words from the report of one of the special correspondents of the *Morning Chronicle*, who visited the small village of Trimingham, where Mr. Warnes has for several years most sedulously and successfully devoted himself to the cultivation and preparation of the plant.

"'The condition of the inhabitants of the village,' he says, 'was a few years since most deplorable, and the amount of pauperism exceeded that of the adjoining parishes.

"'Since the introduction of flax-culture, this state of things has passed away. There is not a pauper in the parish; the poor-rates are nominal; there is not an able-bodied labourer or any portion of his family who may not obtain constant employment throughout the whole of the year; and the moral and social state of the village will bear comparison with most. If the growth of flax can produce results elsewhere similar to those which I have witnessed at Trimingham, there can be no doubt that the sooner it is cultivated to a great extent in this country, the sooner will the enormous burden of pauperism decrease, and happiness and contentment be more generally diffused among the large masses of our labouring population.'

"The communication was received with considerable applause."

Having myself resided near the village for several years, I can but corroborate the foregoing statement.

XV.

Yield and Strength of British Flax.

One feature connected with the flax-culture in this country should not be overlooked, since the following facts assume the most paramount importance.

During the course of my practical experiments in the culture and manufacture of flax in Norfolk, I have convinced myself that one of the most important characteristic qualities which the flax-plant derives from British soil and climate is yield and strength.

The strength is a most essential quality, and abundant yield is generally coupled with good strength, the same as little yield and weak flax are generally coupled together. Little yield and weak flax is oftentimes caused through over steeping. The greatest yield I have heard of since the ten years that I am in this country is that from an acre of flax grown by the Honourable Captain Rous, of Worstead House, near Norwich, it being 7 cwt. 34 lbs. of clean flax per English acre. The next is the yield of 3 acres grown by Sir Henry Durrant, of Scottow Hall, near Norwich, which produced 1 ton 20 lbs. of

clean flax. One acre grown by Mr. Charles Utting, of Heverton St. John, near Norwich, produced 6 cwt. 68 lbs. of clean flax. The latter was the finest of the three lots. This flax was prepared by myself, and the greatest part of it was sold to the Messrs. Marshall and the Messrs. Haves and Atkinson, of Leeds, and was found above the usual strength of flaxes. This flax fetched then (1844) 60*l.* per ton, but would now realise 75*l.* This statement may perhaps appear exaggerated respecting the great yield just alluded to, and must therefore once more, and once for all, say, that I have no interest in any exaggeration, having not for the moment the slightest personal interest in the flax industry of this country, nor in that of any other country. If I take an interest in it, it is for the public good, and because I feel partial to a branch of industry in which many of my family have been profitably engaged since more than half a century. But to return to the subject of the yield of the flax-plant.

I shall now refer to two statements which have already been brought under the notice of the public. Mr. Druce, of Eynsham, near Oxford, grew, in 1850, 5 acres 2 rods 36 perches, which have produced, according to Mr. Druce's own statement, 12 tons 2 cwt. 2 qrs. of flax-straw, which would give 2 tons of clean flax.

Sir James Graham's experiment of last year, of 2 acres 20 perches grown on Crofthead farm, yielded 3 tons 18 cwt. of flax-straw, which would produce 13 cwt. of clean flax ready for market. The yield of the different foregoing statements is at least 30 per cent. more than the average produce of the flax-crop in Ireland.

In the Report of the Royal Flax Society of 1849, a statement was made of the quantity of fibre per acre produced in fourteen districts of the north of Ireland, according to returns made by the local farming societies. This statement shows the average to be a little under 5 cwt. per statute acre, the lowest being 3½ cwt., and the highest 7 cwt. In the provinces of Connaught and Munster the returns do not exceed 4 cwt., making a total average for Ireland of about 4½ cwt. to the statute acre. In England, particularly in Yorkshire and Norfolk, 5¾ cwt. may be taken as the mean produce, and in Belgium the average is 7 cwt. per English acre.

The produce in raw flax or in flax straw has been ascertained in several parts of Ireland to be 40 to 45 cwt. per statute acre (65 to 73 cwt. per Irish acre), weighed when quite dry and before seeding. In Yorkshire, it appears from published statements that 50 to 55 cwt. per statute acre (80 to 89 cwt. per Irish acre) are commonly grown.

XVI.

Flax-spinning increase in Ireland since 1841, *when the Flax Society was established.*

In the Annual Report to the Committee of the Royal Flax Society for the year 1850 we find the following:—

"When this society was founded, in 1841, the Irish flax-spinning trade consisted of about 250,000 spindles. With the increase which has since taken place, and that now making, nearly 390,000 spindles will be in operation next year. The consumption of flax in Irish factories in 1841 was estimated at 16,000 tons; on the same data it will be, next year, about 25,000, being an increase of 9000 tons. Taking 5 cwt. of flax as the average produce per statute acre, this increase would alone require an additional breadth of 36,000 acres, being more than one half of the entire Irish growth; while, to supply the Irish flax spinners would take 100,000 acres, being 30,000 more than the present average sowing.

"To extend the comparison over the United Kingdom, we find that, while the import of foreign flax in the years 1840, 1841, and 1842 averages annually 62,500 tons, in 1848, 1849, and 1850, to the 10th of October in each year, it averaged 83,800, an increase of 21,300 tons; that increase alone being nearly equal to the production of 84,600 acres. If, therefore, the large extent of the imports of foreign flax was dwelt upon in 1841, when the society was formed, it is evident that the arguments in favour of increasing the extent of flax cultivation in Ireland are strengthened in the ratio of the increase which has since taken place. Your committee would

beg your attention to a fact which cannot be too frequently enforced on public attention, viz. that, while Ireland at present produces only about 60,000 acres of flax, to supply the existing demand in the United Kingdom for the different products of the crop nearly 500,000 acres would be annually required; and also, that, with the exception of a smaller proportion of the finer flaxes of Belgium, the entire of the foreign import could be replaced with Irish, to the great advantage of the linen trade, from the superiority of the latter. Nor, in the event of a greatly increased production of flax in Ireland, is the market limited to the quantity required by the British Isles, for France, Belgium, Spain, the United States of America, and other countries, might be calculated upon as customers to a considerable extent."

This extract indicates nothing less than that Ireland seems to be destined to be one of the greatest producing countries for flax and linen in the world. The trade is one whose connection with agriculture renders its success a matter of the most vital importance, for not only does it employ a large number of male and female operatives, but it is at the same time capable of being made a source of vast wealth to the rural population.

XVII.

Schenck's System of Steeping.

I have already said that without the flax-factorship be established in this country, the farmer will never feel strongly inclined to grow flax; but let factors establish themselves, and the farmers will extensively grow the crop; but as the conveniences of water for steeping the plant (although numerous) are not perhaps exactly so general in England as in Ireland, Schenck's system will in many instances be preferred by the factors, and will undoubtedly be the means of increasing and accelerating the flax-culture in this country.

Messrs. Bernard and Koch, in their pamphlet on Schenck's system of steeping, recommend that

"Parties desirous to enter into this new branch of business in districts where flax has not been usually grown, should ascertain—

"Whether the general character of the land is suitable for the growth of flax;

"Whether a sufficient quantity is likely to be grown in the immediate neighbourhood—say ten miles round;

"The quality of the water, and if a constant supply for the retting process can be had during the whole of the year.

"They should also engage a person who thoroughly understands the flax-growing to select the land in the first instance, and to give the general directions as to the management of the crop up to the harvesting. By doing this, they will introduce at the onset the best method, and avoid the risk of trials made without practical knowledge. This remark applies chiefly to England, in many parts of which the flax-crop is not generally understood, and where prejudices still exist against it."

The following explanations on Schenck's patent system will afford practical information on the subject:—

"Locality of a Rettery.

"In the selection of a site for a rettery the following requisites, which are all of importance, must be kept in view. They are—

"An open space of four to eight statute acres, according to the proposed size of the establishment, accessible by good roads, and unsheltered by either hills or plantations, to ensure quick drying.

"A constant supply of pure soft water for retting, having, if possible, a fall of six feet, by which pumping is avoided.

"A good outlet for the waste water.

"The vicinity of a village, or of cottages, from which a sufficient number of hands can be obtained.

"If the machinery is to be driven by water-power it is absolutely necessary that the supply of water be never failing. Great inconveniences and serious losses would be caused by a partial stoppage of the work during the best season; it would then be found necessary to erect a steam-engine, which would cause an additional outlay."

Construction of a Rettery.

To explain the construction of a rettery building I cannot do better than give almost an ex-

tract from the work of Messrs. Bernard and Koch, who write as follows :—

"The manner of laying out the buildings of a rettery must vary according to local circumstances; but there are some principles which must in all cases be kept in view. Economy of labour is aimed at in all manufacturing establishments, and in a rettery this point is of paramount importance. Flax is very bulky, and has to undergo so many manipulations in its dry and wet state, that the arrangements must be such as to save all unnecessary handling, carrying, and labour of any kind. For this purpose the different operations must be carried on in distinct places contiguous to each other, and, in order to avoid any confusion, they should follow each other in onward direction. Ample space must be given in each department, want of room being of great disadvantage."

According to Messrs. Bernard and Koch's explanation, the buildings consist of the following compartments :—

"The seeding room with loft above.
"The vat-house and spreading room.
"The drying sheds.
"The desiccating house.
"The store sheds.
"The scutching mill and engine or waterwheel house.

"The seeding room must be of large size, so as to allow ample room for the manipulation, and to contain a stock of flax. For the greater facility of bringing the flax in, it should be on the ground-floor, be lofty enough, and have doors sufficiently large to admit loaded carts or trucks. It should be so situated that a shaft can be brought in and driven from the main power, and so that it be in communication with the vat-house.

"The loft is used for cleaning and storing the seed, and for various other purposes: it should have a good strong floor.

"The vat-house and spreading room consist of a ground floor only. They can be built together, with a valley-roof resting on pillars. The portion of roof over the vats should have covers to give ventilation and to allow the free escape of the vapours which arise from the vats. Asphalta makes a good floor for the spreading room. All the doors should be at least six feet wide. Hooped wooden vats, oval shape, having been found to answer best; they resist the pressure caused during the fermentation, and are not liable to frequent leakage; they are also handy to work, and can be easily repaired. Wooden square vats, however strongly made, do not keep stanch for a long time.

"The drying sheds are to be erected on an open space, well exposed to the winds, and not far distant from the spreading room. They must be placed at right angles with the prevailing wind, and at fifty or sixty feet distance from each other.

"The desiccating house is divided into two separate rooms, each to contain the flax of one day's work. A fire-proof construction is to be preferred.

"The store-sheds are necessary for housing the dried flax previous to its being scutched. They should be erected near the scutching mill, and made so as to allow carts to go under.

"The scutching mill must be immediately adjoining to the power, whether steam or water; it must be dry and well lighted, and of sufficient dimensions to contain besides the machinery a stock of flax-straw, and to give plenty of room to the workers.

"The stack-yard should be situated as near as possible to the main work, and facing the seeding house.

"WORKS PERFORMED IN A RETTERY.

"The seeding is done by a machine made expressly for the purpose and acting by means of rollers, between which the seed-end of the flax is passed sidewise two or three times, the capsules or bolls are crushed, and the seed falls out uninjured, the flax-straw being neither crushed nor put out of

shape. After the buts have passed through the machine, they are lashed to shake out the loose seed and the broken bolls.

" As the flax requires to be in a dry state for that operation, a stock equal to several days' work should always be kept in the seeding house. This stock to be renewed whenever the state of the weather permits.

" The seed and bolls are then passed through a dressing machine fitted for the proper sieves. Seed intended for sowing should receive a double cleaning to remove all light pickle. The clean seed should be kept on a well-ventilated loft, and be allowed to remain some time exposed to the air, receiving occasional turnings before it is put into bags—barrels are better.

" The bolls or chaff are excellent food for cattle when steamed and mixed with turnips.

" Several other methods of seeding have been resorted to, but they are all open to objections.

" Threshing machines cause a great waste, and damage the ends of the flax, and part of the seed is left in the centre of the but. Rippling requires a large space and numerous hands; is too slow and expensive; besides, in this case, as with the threshing machine, the bolls have to be crushed afterwards. Beating seed off by hand is less objectionable, but it is only applicable on a smaller scale.

" Sorting.

" This work must be done very carefully, and requires experienced hands. The sorters have to separate the different qualities, according to colour and length, forming new buts containing but one quality.* They pass these new buts to

* The object of sorting is not only to separate the different colours and lengths, but it is of much more consequence to separate the coarse and fine and the parts that have been lying, as these three different sorts, if steeped together, will cause great waste in the scutching; besides, when scutched together and intermingled with the better part of the fibre, it makes it altogether of an inferior quality.

the binders, who tie them singly, as handed to them, keeping the roots square. Rush bands are preferable. It is a good plan to cut off the roots by a machine like a chaff-cutter, as it facilitates the after handling; the buts are now selected and piled up according to quality. The object of seeding is to have every vat filled with the same description of flax, which ensures a more uniform retting and more even quality. The flax is now ready to go into the vat.

"RETTING OR STEEPING.

"In order to have in every vat as nearly as possible the same relative proportions of flax and water, it is well to weigh the flax before putting it into the vat: the buts must be placed carefully upright, the roots resting on the false bottoms, and pressed slightly together by the workman as he goes on filling, care being taken that all be straight to facilitate a free upward circulation of the heated water and the gases. When the vat is filled with flax, the covers are put on and secured with cross-bars, so as to keep the flax 4 or 5 inches immersed in the water. The vats are then filled up with cold water, and enough steam is turned on to raise the heat to 90 degrees in about eight hours; the temperature of the water is not to exceed at any time 90 degrees, but must be kept uniformly at that degree day and night during the whole retting process. This is easily effected by letting in steam whenever the temperature begins to fall. The flax must not be left any length of time in the cold water, as it would retard the fermentation; therefore the vats must not be filled with cold water long before the time the steam is to be put on.

"The number of hours for the retting are to be reckoned from the time the steam is turned on first. The duration of the process averages about sixty-six hours, but varies according to circumstances such as the following:*—

* If flax can be considerably deteriorated in strength by being half a day too long in cold water, what must it be when left a few hours too long in hot water? The effect of an hour in hot water

"*The Quality of the Water.*—That which is soft and more suitable for fermenting purposes will produce a more active and quicker retting.

"*The Description of Flax.*—Good sound well-matured and well-saved flax requires more retting than unripe, green pulled, or otherwise damaged flax.

"*Quality aimed at.*—If the object is to bring the fibre to great fineness, the retting must be carried on longer than for obtaining a stronger but coarser article.

"In some cases a temperature of 80 and 85 degrees may be advantageously used, but the retting will then require a longer time than with the water at 90 degrees.

"One of the best tests for ascertaining when flax is properly retted is to take a few stalks of average fineness, which are broken in two places, about three inches apart; if the wood so broken separates easily on being drawn downwards, without tearing the fibre or retaining any part of it, the flax is sufficiently retted, and the water may be run off.

"It may answer in some cases to give two successive rettings to some flax. Strong hearty flax will be improved by this double operation, but of course it increases the expenses. After the first retting, flax must be thoroughly dried before it is put again in the water for the second operation.

"DRYING.

"It is important that flax should be dried as quickly as possible, to prevent any further decomposition. For this purpose, it is spread between the holders which are suspended under the drying sheds. These holders consist of a double wooden rod, fastened together with a wire staple and bag in the centre, and by metal rings at each end. The under-rod is placed on a table, flax is spread evenly over it, and the

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makes more than half a day in cold water; it therefore necessarily follows that the hot water system of steeping must be a peculiar mode of steeping, and if great attention is required in the cold water steeping, it must be so ten-fold in the hot water steeping.

upper rod is put on and fastened, as mentioned above. It takes fifty holders for each cwt. of flax, weighed when dry.

"The flax has to remain three days under the drying-sheds, in favourable weather it will be quite fit for being tied and stacked; but if the atmosphere is damp, the drying must be completed by means of artificial heat, which should not exceed 90 to 100 degrees. This last process must be watched very carefully, for if the flax be overdried its quality may be considerably impaired. Flax must in no case be scutched immediately after drying; it should first be put into stacks, or under open sheds, where it has to rest. Six weeks is considered to be of sufficient time to bring it to its scutching point.

"SCUTCHING.

"Flax can be scutched either by hand or by machinery. Hand-scutching, although productive of good results when performed by a skilful workman, is not practicable on a very large scale, owing to the difficulty of procuring the number of trained hands necessary for the work; machinery must necessarily be resorted to. With that at present in use the operation of scutching requires, on the part of the workman, practice and experience; in fact, it is a profession of itself; a description would be quite inadequate to convey a correct idea of it, and would in no case enable a person to do the work who had not learned it practically. Machines have been brought out lately, calculated to dispense with skilled labour, and there is every probability that they will be brought to work satisfactorily.

"The shoves, or woody part, produced at the scutching mill are used as fuel, three tons of which are equal to one ton of coals in raising steam.

"CLASSING.

"On leaving the scutching mill, flax has finally to be classed according to its value and quality, and to be made up into bundles, after which it is ready for market. Each ret-

tery should adopt a regular classification for the different qualities, each being always represented by the same mark and denomination. This will facilitate the sale.

"In order to give an approximate idea of the outlay involved in the erection of a rettery, and of the cost of labour, the following estimates for the establishment of two different sizes have been carefully calculated, and a statement of the number of hands required by each is also subjoined.

"RETTERY CALCULATED TO CONSUME THE PRODUCE OF TWO HUNDRED ACRES.*

"*Plant.*

	£.	*s.*	*d.*	£.	*s.*	*d.*
"Six vats, of 3000 gallons, with steam-pipes, cocks, &c.	140	0	0			
Main steam-pipe and main cock	10	0	0			
Water-pipe and 4 cocks or valves	12	0	0			
5000 drying-rods and rings	55	0	0			
Seeding machine	15	0	0			
Root-cutting machine	4	0	0			
Dressing machine and sieves	8	0	0			
Desiccating apparatus	60	0	0			
Weighing-bridge	20	0	0			
Sundry implements—tables, barrows, &c.	36	0	0			
				360	0	0
Twelve-horse boiler, and eight-horse high-pressure steam-engine	160	0	0			
Shafting	15	0	0			
Scutching machinery	140	0	0			
				315	0	0
"*Buildings.*						
"Seeding-house—2 stories, 80 by 25 feet, walls 20 feet high, slated roof, ground-floor asphalted, upper floor 3-inch plank	300	0	0			
Carried forward	300	0	0	675	0	0

* A plan of these buildings is added to the work on flax by A. Bernard and Koch.

	£.	s.	d.	£.	s.	d.
Brought forward - - -	300	0	0	675	0	0
Vat-house and spreading-room—80 by 36 feet, walls 10 feet high, felt roof, asphalted floor in spreading-room -	130	0	0			
Scutching-mill—45 by 25 feet, walls 11 feet high, slated roof, asphalted floor -	110	0	0			
Engine-house and chimney - - - -	70	0	0			
Desiccating-house—20 by 20 feet, brick walls, plastered inside and ceiled, slated roof, or iron beams and brick arches, to be fire-proof - - - - - - - -	60	0	0			
Drying-sheds—eight sheds, 84 by 12 feet, all wood - - - - - - - - -	100	0	0			
Store-sheds—two sheds, 60 by 16 feet, all wood - - - - - - - - -	50	0	0			
				820	0	0
Total - - -				£ 1,495	0	0

"In case of water-power being employed instead of a steam-engine, a portable upright boiler will be sufficient, the cost of which is 50*l*. This, not requiring a masonry chimney, will effect a saving of about 100*l*.

"*Hands employed.*

——	Men.	Boys.	Girls.
"General work . . .	1 Manager . .	0	0
Ditto	1 Day-fireman .	0	0
Ditto	1 Night-fireman .	0	0
Ditto	1 Watchman . .	0	0
Ditto	1 Man . . .	2	0
Seeding*	1 Man . . .	0	7
Retting and drying . .	1 Man . . .	4	10
Scutching	1 Foreman . .	0	0
Ditto	8 Scutchers . .	0	8
Ditto	1 Maker-up . .	0	0
Total . . .	17	6	25=48

* For six months of the year only.

"RETTERY CALCULATED TO CONSUME THE PRODUCE OF FOUR HUNDRED ACRES.

"*Plant.*

	£.	s.	d.	£.	s.	d.
"Twelve vats of 3000 gallons, with steam-pipes, cocks, &c.	280	0	0			
Main steam-pipe and main cock	10	0	0			
Water-pipe and 8 cocks	24	0	0			
10,000 drying-rods and rings	110	0	0			
Two seeding machines	30	0	0			
Root-cutting machine	4	0	0			
Dressing-machine and sieves	8	0	0			
Desiccating apparatus	90	0	0			
Weighing-bridge	20	0	0			
Sundry implements—tables, barrows, &c.	54	0	0			
				630	0	0
Sixteen-horse boiler and twelve-horse high-pressure steam-engine	240	0	0			
Shafting	20	0	0			
Scutching machinery	240	0	0			
				500	0	0

"*Buildings.*

"Seeding-house—84 by 36 feet, 2 stories, walls 20 feet high, slated roof, ground floor asphalted, upper floor 3-inch plank	400	0	0			
Vat-house and spreading-room—84 by 56 feet, walls 10 feet high, felt roof, with valley and iron columns, asphalted floor in spreading-room	200	0	0			
Scutching-mill—50 by 36 feet, walls 11 feet high, slated roof, asphalted floor	100	0	0			
Engine-house and chimney	100	0	0			
Desiccating-house—40 by 20 feet, brick walls, plastered inside and ceiled, slated roof, or with iron beams and arches, to make it fireproof	100	0	0			
Drying-sheds—8 sheds, 84 by 12 feet, all wood	200	0	0			
Store-sheds—4 sheds, 60 by 16 feet, all wood	100	0	0			
				1260	0	0
Total				£ 2390	0	0

"*Hands employed.*

——	Men.	Boys.	Girls.
"General work . . .	1 Manager . .	0	0
Ditto	1 Day-fireman .	0	0
Ditto	1 Night-fireman .	0	0
Ditto	1 Watchman . .	0	0
Ditto	2 Men . . .	4	0
Seeding*	1 Foreman . .	0	0
Ditto	2 Men . . .	0	14
Retting and drying . .	2 Men . . .	5	20
Scutching	1 Foreman . .	0	0
Ditto	16 Scutchers . .	0	12
Ditto	2 Makers-up . .	0	0
Total . . .	30	9	46=85

"The patentees are anxious to afford to parties entering into this business the information and advice which their experience enables them to give. Whenever the erection of a rettery has been decided upon, they will, if it is required, visit the intended locality, so as to assist in laying out the establishment; and they will contribute as much as lies in their power to place each new concern on such a footing as will ensure success.

"Communications to be addressed A. Bernard and Koch, Belfast."

* For six months of the year only.

XVIII.

Belgian Flax-Factorship.

The establishment of a rettery on Schenck's system, with all the requisites to set at work, comprising a stock of 400 acres of flax, would require a capital of from 6000*l.* to 7000*l.* Many individuals of enterprise are quite ready to lay out this sum and to embark in this business, if a few starters could but show that capital can be thus profitably invested, but, until this be evidently proved, it is doubtful whether parties will be forthcoming with the speed which the urgency and importance of the flax-culture demands; yet it is upon the establishment of the flax-factorship that the flax-growers of this country are looking up for a market; and as only but a few will start this season to establish retteries on Schenck's system, I should strongly recommend for the present the adoption of the Belgian flax-factorship system.

The expenses for buildings to establish a flax manufacture for the fabrication of 100 acres of flax would not be more than 200*l.*, there being nothing else wanted than a scutching-place for

25 men. There can, therefore, be no risk to run in beginning the flax-factorship on the Belgian system; moreover, it furnishes ample means to acquaint the parties thus engaged to become familiar with the various modern processes of preparing the flax for market; and when thoroughly master of the business, the factor can then make a better calculation, and see how far it would answer his purpose to embark largely in the business; and it is but just to observe here, that, if the Belgian system of flax-factorship should not answer, certain it is that Schenck's system will much less do so. My long experience in this country of the produce of flax and its expenses of fabrication enables me to give an account of what profits this branch of business would realise to the flax-factor, if properly engaged in it.

It should be recollected that the flax is sold in Flanders to the factor a few days before the crop is ready for pulling; the farmer sells the flax-straw to the factor and retains the seed. The moment the flax is sold, the farmer has no more to do with the management of the crop; the only thing the farmer does in favour of the factor is to give him his barns to take off the seed, his horses and waggons to remove his flax, and the use of his meadows and waters. The price of the flax is generally paid down the moment that the pur-

chase takes place; thus, the farmer receives often the amount of his crop while yet growing.

A flax-factor who has everything to learn in this country could not pay more on an average than 8*l.* per English acre;* the fabrication of 100 acres of flax would require about 20 men during the whole year, and 10 boys or girls during the months of June, July, August, and September. During these four months the whole body, men and boys or girls, would be employed in pulling, steeping, grassing, &c.: after these processes are all over, which is then the latter part of September or the beginning of October, the 20 men begin the hand-scutching, a process which can only be properly and profitably performed during eight months of the year, the scutching during the drought of summer being very injurious to the flax, it reduces quality and quantity to a considerable extent. The expenses of labour may differ, perhaps, a little in some counties in England; labour in Norfolk may, perhaps, be a trifle lower than in the manufacturing districts, but this cannot make a material difference. The average price of what I made of about 100 acres of flax was 60*l.* per ton. But the present flax price is 20 per cent. higher than in 1845; besides, I need not say that there

* It is understood without the seed.

is a fluctuation in the flax market, as in all other articles, through scarcity or other circumstances, although the price of flax does not fluctuate so much in the middle quality as in the superior and inferior qualities.

PRODUCTION OF 100 ACRES OF FLAX-STRAW.

	£.	s.	d.
100 acres of flax-straw produce 30 tons of clean scutched flax, ready for market, at 65*l.* per ton -	1950	0	0
7½ tons of tow, at 15*l.* per ton - - - - -	112	10	0
110 tons of shoves, at 6*s.* per ton - - - -	33	0	0
Total - - -	£ 2095	10	0

THE COST PRICE AND EXPENSES OF THE FABRICATION OF 100 ACRES OF FLAX.

	£.	s.	d.
100 acres of flax-straw at 8*l.* per acre - - -	800	0	0
Pulling, at 15*s.* per acre - - - - - -	75	0	0
Tying-up and stacking, at 12*s.* per acre - - -	60	0	0
Taking off the seed, at 8*s.* per acre - - - -	40	0	0
Steeping, at 20*s.* per acre - - - - - -	100	0	0
Grassing, at 10*s.* per acre - - - - - -	50	0	0
Turning, at 5*s.* per acre - - - - - -	25	0	0
Tying-up and carting to the scutching establishment, at 15*s.* per acre - - - - - - - -	75	0	0
Sorting before scutching, at 5*s.* per acre - - -	25	0	0
Scutching 30 tons, at 15*s.* per ton - - - -	450	0	0
Interest of building (200*l.*), at 5 per cent. - -	10	0	0
Total - - -	£1710	0	0

Produce, brought forward - -	£ 2095	10	0
Expenses - - - - - - -	1710	0	0
Net Profit hand-scutching -	£ 385	10	0

The scutching under the Belgian modes of

preparing the flax for market is all done by hand, a process which is considerably more expensive than when done by machinery, but the hand-scutching is doubly compensated by the extra yield and superior quality that it produces.

Besides, the expenses of the implements for the hand-scutching of 20 men would not be more than 20*l.*, they being exceedingly simple; instead of which, a flax-scutching mill, to scutch from 400 to 500 acres of flax per year, would cost from 200*l.* to 500*l.*, as the machinery must be driven either by water, horse, or steam power.

The difference in the produce upon 100 acres of flax of the same quality, scutched by machinery, would be as follows:—

PRODUCTION OF 100 ACRES OF FLAX-STRAW, SCUTCHED BY MACHINERY.

	£.	*s.*	*d.*
100 acres of flax-straw produce 27 tons of clean scutched flax, at 55*l.* per ton	1485	0	0
10 tons of tow, at 15*l.* per ton	150	0	0
110 tons of shoves, at 6*s.* per ton	33	0	0
Total	£1668	0	0

EXPENSES OF THE FABRICATION OF 100 ACRES OF FLAX-STRAW.

	£.	*s.*	*d.*
100 acres of flax-straw, at 8*l.* per acre	800	0	0
Pulling, at 15*s.* per acre	75	0	0
Tying-up and stacking, at 12*s.* per acre	60	0	0
Taking off the seed, at 8*s.* per acre	40	0	0
Carried forward	£975	0	0

	£.	s.	d.
Brought forward - - -	975	0	0
Steeping, at 20s. per acre - - - - - - -	100	0	0
Grassing, at 10s. per acre - - - - - - -	50	0	0
Turning, at 5s. per acre - - - - - - -	25	0	0
Tying-up and carting to the scutching-mill, at 14s. per acre - - - - - - - - - -	70	0	0
Scutching 27 tons, at 8l. per ton - - - -	216	0	0
Total - - - -	£ 1436	0	0

Produce, brought forward - - -	£ 1668	0	0
Expenses - - - - - - -	1436	0	0
Net profit (mill-scutching) -	£ 232	0	0

The two foregoing statements will show a balance of 153*l.* 10*s.* in favour of the hand-scutching, although I do not pretend to say that the hand-scutching, notwithstanding its great superiority, could always be practised on a very large scale in this country;* but I venture to suggest that it would be prudent to begin the flax fabrication on the methods adopted in Belgium, and I feel satisfied that any individual, with a small capital of from 1500*l.* to 2000*l.*, and accustomed to a rural life, would find the flax fabrication a most pleasant and remunerative business.

* Having the scutching establishment in the neighbourhood of a populous place is the means of carrying it on more largely. Boys from 15 to 17 years of age are the best to become expert in the hand-scutching. The flax fabrication from 100 to 150 acres will generally pay better than to carry it on more extensively; moreover, the more numerous the factors are the more competition there is in the market, and it shortens the transportation of the bulky article.

Before going to such considerable expenses as a rettery on Schenck's system demands, why not first make use of the natural economical facilities which this country possesses in water-streams for steeping the flax? It is pretty well proved and known that the flax steeped in the Belgian method is of much greater value than that steeped on any other mode.

Chevalier Claussens, notwithstanding the great opinion he entertains of his own method of steeping, says, in his pamphlet, 'The Flax Movement,'—

"Probably the best mode of steeping the flax is that of placing it in running streams, according to the mode adopted in Courtrai, the principal flax-growing district in Belgium."

Among the numerous water-streams and rivers which this country possesses, many are, perhaps, as well qualified for steeping flax as the river Lys, in Belgium: to put this to the test in submitting them to the examination of a competent person would be prudent.

XIX.

Hartismere Flax Association.

Last season, 1851, several of the tenant farmers of Sir E. Kerrison, in the neighbourhood of Eye, Suffolk, had expressed a wish to grow flax. Mr. Edward Kerrison therefore took prompt steps to promote the wishes of his father's tenant farmers, and requested me to accompany him to Oakley Park, and passed in the course of a few days over a great portion of the estate, which I found in a very high state of cultivation, and most admirably adapted for the flax culture. During the few days that I was there an association was formed to introduce the growth of flax on the estate of Sir E. Kerrison, in Suffolk, and it is satisfactory to see, by the second public meeting of that association, that already great progress has been made by a few flax-growers, and that decisive steps are about to be taken to secure a market for the farmers' flax-straw.

"A meeting of the Hartismere Flax Association was held at the White Lion Hotel, on Monday last, Edward C. Kerrison, Esq., in the chair.

"The CHAIRMAN, in opening the meeting, pointed out, in the most able manner, the many advantages that would result

from a general cultivation of flax, showing it would be remunerative to the growers, and a means of employment for the poor. He also congratulated them upon the proposed erection of a rettery and scutching-mill this spring, and thus establishing a home market, the want of which, up to the present time, has been the great obstacle to the growth of that invaluable plant.

"Mr. F. STANFORD, of Darsham-hall, stated, for the information of the meeting, the result of his cultivation of four acres of flax last year. He obtained seven coombs of seed per acre, now worth 30*s.* per coomb, and more than two tons of fibre per acre, for which he had been offered 3*l.* per ton.

"After statements from several other gentlemen, the following resolution was unanimously agreed to:—'That, Mr. Ludolf having signified his intention of purchasing all flax grown in this district at a fair price, in due season, and of establishing a rettery in this neighbourhood, this meeting are of opinion that they may safely recommend farmers in this district to commence preparing land for the growth of the crop.'

"The CHAIRMAN stated that he could not allow the meeting to separate without proposing a vote of thanks to Mr. Henry Bishop, Mr. Henry Wells, and Mr. Robert Chase, for the great assistance they have rendered the Association, and in directing the attention of the farmers to the advantages of cultivating flax.

"After which a vote of thanks was given to the Chairman, who, in reply, stated the pleasure he should have on every occasion of promoting the object for which they had met."

When about going to press I received the following communication:—

Hartismere Flax Association, Eye,
23rd February, 1852.

DEAR SIR,

ENCLOSED I send you the Resolution agreed to on the 2nd of February: since then Mr. Ludolf has been at Eye for the purpose of looking out a spot to erect his mill.

Yours respectfully,
HENRY BISHOP,
Secretary.

Mr. E. F. Deman,
26, George Street,
Portman Square, London.

AT a Meeting held at the White Lion Hotel, Eye, on Monday, February 2nd, 1852, the following resolution was agreed to:—

"That MR. LUDOLF having signified his intention of purchasing all flax grown in this district at a fair price in due season, and of establishing a rettery in this neighbourhood, this meeting are of opinion that they may safely recommend farmers in this district to commence preparing land for the growth of the crop."

Growers of flax wishing to avail themselves of the Association's Instructor, MR. SAMUEL NEIL, who is retained for a fortnight, are requested to apply immediately to the Secretary, MR. HENRY BISHOP.

N.B.—*Flax will succeed after oats, wheat, barley, or potatoes, but not after a turnip crop.*

From the foregoing communication of the Secretary of the Hartismere Flax Association it will be seen that the flax-culture is also established on a firm footing in some parts of Suffolk.

THE following pages on the Cultivation and Management of Flax were not on their original publication designed to form part of the present volume, but such an arrangement has been thought desirable on account of the correspondence of subject with that which precedes.

FLAX;

ITS

CULTIVATION AND MANAGEMENT,

&c. &c.

DEDICATED

TO THE

LANDLORDS OF THE UNITED KINGDOM,

AS A SMALL TOKEN OF GRATITUDE FOR THE ACTS OF KINDNESS AND FRIENDSHIP RECEIVED FROM SEVERAL PERSONAGES OF DISTINCTION,

BY

THE AUTHOR.

London, 1852.

PREFACE TO THE FIRST EDITION.

It is hoped that this little work, notwithstanding its many defects, will be found useful, as offering the only exact instructions yet given of the improved methods to grow and prepare Flax for spinning; and although but little acquainted with the English language, I have not thought it proper to subject it to the revision of a person well versed in it, from fear that perhaps, by altering my expressions, the real meaning of my instructions might be misunderstood. My sole object has been to explain, in my own brief and plain terms, the different modern processes by which can be obtained a crop superior in value to any that the soil can otherwise produce.

PREFACE TO THE SECOND EDITION.

The first important step which I considered indispensable to introduce and promote properly the Flax culture in this country, was to publish a few pages illustrating those various methods of growing and preparing Flax for market which are so successfully adopted in that country (Belgium), so renowned for all that is exquisite in fact of flax. My information and instructions thus given have been sought for with much avidity through the medium of my little work; and the patronage, support, and congratulations I have received are very gratifying; and have naturally induced me to publish a Second Edition, which I have augmented with interesting extracts from the last Annual Report of the Royal Irish Flax Society; —I have also added some satisfactory authentic statements of recent experiments made by clever English Flax-growers.

INTRODUCTION.

A NATIVE of Belgium, and from my younger years engaged as an extensive flax-grower and manufacturer, I was requested to render my humble services to the Royal Irish Flax Society, and was engaged during the years 1841 and 1842 as the technical instructor of that Society; and, in passing, it is scarcely needful for me to add, that those services have been acknowledged with gratitude by those who have benefited by my exertions.

In the above situation, and with the experience of many years in my own country in this important branch of agriculture and native industry, it will readily be understood how my advice, on many practical points in connexion with the growth and management of flax, has been continually sought by experimenting agriculturists from all parts of the kingdom, and which I hope, even in this age of book-making, will be considered a fair apology for my publishing a few pages to simplify and practically instruct the flax-growers of this country in "the various Belgian methods of growing and preparing flax for the market."

After having visited several counties in England, and having analysed different sorts of soils and water, I can confidently assert that this beautiful island is capable of producing as good, and, even better, qualities of flax than those countries from whence the finest flax is actually im-

ported; and it is a fact beyond all dispute, that its geographical position, as well as the elementary properties of the soil and water, are most admirably adapted for the growth and preparation of this valuable plant, which with an abundance of capital and a good market at home (two important advantages which this country possesses) might become the most profitable staple commodity of British agriculture and manufacture; for both ancient history* and modern experience testify to the truth that the flax plant is the most profitable known, which may be proved by the striking fact, that one acre of flax, when manufactured into that precious article, Brussels lace, is worth 20,000*l.*, most of which indeed is labour and profit.

It is needless for me to point out how strenuously the efforts of the most zealous and scientific agriculturist should be directed to the introduction and extension of a branch of industry, which, in its various departments, affords, from a given surface of land, employment to a greater number and a greater variety of individuals than any other branch of human occupation. The agriculturist, the mechanist, and chemist, are all equally occupied in its cultivation and preparation.

It is surprising that some continental people are still surpassing the British in several important branches of agriculture, yet they have the same facilities and advantages to excel in every branch of agriculture as they now

* Flax is of the greatest antiquity, coequal with the Bible: there are several allusions to flax in that sacred volume, for we find that "Rahab hid the spies with the stalks of flax, that were laid in order on the roof of her house." "Solomon had horses brought out of Egypt, and linen yarn; the king's merchants received the linen yarn at a price." Job complained that his "days were swifter than the weaver's shuttle." Fine linen is also frequently mentioned as one of the most precious ornaments of the Temple.

do in almost every branch of manufactures. In short, what is agriculture but a manufacture, in which, through the agency of the soil, the raw materials of seed and manure are worked up into produce?

Recent discoveries have shown that, with scientific aid, there is scarcely any limit to the obtainable produce of the soil; and if these remarks apply to crops in general, they do so to flax tenfold; however, taking the growth of flax, and its various after processes, in a certain point of view, it should be considered as consisting of two distinct branches, the one a branch of agriculture, and the other a branch of manufactures.

The Growth of Flax Cleanses and Fertilizes the Land.

There has been, and there still exists, a prejudice against the cultivation of flax, a prevalent idea being entertained that it is an exhausting crop; but since flax (to secure a fine silky fibre) should be taken from the land (pulled) in a very green state. it follows that flax can only be considered as a green crop; and as the preparation of the land for flax requires more ploughing, subsoiling, and cleansing than for any other crop, it consequently becomes an indisputable fact that the growth of flax, instead of exhausting, cleanses and fertilizes the soil.

In Belgium a better wheat crop is obtained after flax than after any other crop.

Besides, there is no crop that comes to maturity in a shorter period than flax, it being sown in April and pulled in the latter part of June, and thus, with the aid of a

small quantity of liquid manure, a crop of turnips is obtained the same season, a strong proof that the soil has not been exhausted by the flax; moreover, the land will improve by bringing flax in the rotation of crops, as the soil cannot be cultivated by too great a variety of productive and useful plants.

Different Methods of Preparing Flax for Market.

In Belgium there are two methods of preparing the flax for market. The one is practised in the West Flanders and in the French Flanders, and is called the Courtrai System, or white steeping and bleaching. This system is admirably adapted for this country, as it can be carried on on a large scale much better than the Blue System. It also requires more capital on the part of the manufacturer, as the flax is not ready for market before it is two or three years old; however, this system can only be practised where there is the convenience of good running water.

The Blue System is practised in different parts of Belgium, there being no difficulty under this method of finding steeping-places. The flax is manufactured and brought to market the same year that it is grown.

The following statements are the average value of flax in Belgium, in its green state, and also when manufactured for market; but let it not be understood that I pretend to say that the same money will be realized by the young flax-grower on his first attempt—such an assertion would be quite ridiculous and absurd, as it would require a few years to bring the article to market

in such perfection as the Belgians, even should the flax-grower follow my instructions in the strictest manner; but let him be satisfied that he will, from the first attempt, realize more money from an acre of flax than from any other crop.

It will be readily understood that although my instructions are simple, clear, and correct, yet there are peculiarities in every process connected, especially with the manufacture of flax, that can hardly be ascertained without some experience; and although, as I have observed, my instructions are simply and clearly laid down, they will, in many instances, vary, according to circumstances from the actual practice required.

Value of an Acre of Flax in the Blue Districts; in its green state, when ready to pull.

	£.	s.	d.	£.	s.	d.
One English acre, fair quality . .	12	0	0			
Seed	2	0	0			
				14	0	0

Expenses for Growing an Acre of Flax in the Blue Districts.

	£.	s.	d.			
Rent and taxes of one acre . .	1	15	0			
Ploughing and sowing . . .	1	0	0			
Seed	1	5	0			
Manure	1	10	0			
Weeding	0	10	0			
				6	0	0
Leaving profit to the grower .				£8	0	0

It should be understood, that the seed is seldom sold to the manufacturer, but only the flax, the seed being much more valuable to the farmer than to the manufacturer.

*Value of an Acre of Flax in the West Flanders and Environs of Tournay; in its green state, when ready for pulling.**

	£.	s.	d.	£.	s.	d.
One acre of good quality . . .	16	0	0			
Seed of 1 acre of good quality . .	1	15	0			
				17	15	0

Expenses for Growing an Acre of Flax in the West Flanders and Environs of Tournay.

	£.	s.	d.			
Rent and taxes	1	15	0			
Ploughing and sowing . . .	1	10	0			
Manure	2	0	0			
Seed	1	15	0			
Weeding	0	15	0			
				7	15	0
Leaving profit to the grower .				£10	0	0

On the Blue System.

Value of an Acre of Flax when Manufactured ready for Market, i.e. when Scutched.

	£.	s.	d.	£.	s.	d.
7 cwt. of Flax, at 80*s.* per cwt. . .	28	0	0			
2 cwt of Tow, at 10*s.* per cwt. . .	1	0	0			
Value carried forward . . .				29	0	0

* When the flax-grower misses his market of selling his crop green on the field, he seldom thinks of manufacturing it himself, and holds it over till a more favourable time, when he then sells by the weight, the value of which varies from 6*l.* to 9*l.* per ton. The produce of an acre is from two to two and a half tons.

Expenses of Manufacturing an Acre of Flax ready for Market.

	£.	s.	d.	£.	s.	d.
Value brought forward . .				29	0	0
Price of 1 acre	12	0	0			
Pulling	0	14	0			
Rippling	0	15	0			
Steeping and carting	0	16	0			
Spreading	0	15	0			
Turning	0	5	0			
Scutching 7 cwt. at 12*s.* . . .	4	4	0			
				19	9	0
Profit to the manufacturer .				£ 9	11	0

On the Courtrai System.—Summer Bleaching.

Value of an Acre of Flax when Manufactured ready for Market (Scutched).

	£.	s.	d.	£.	s.	d.
7 cwt. of Flax, at 6*l.* per cwt. . .	42	0	0			
2 cwt. of fine Tow, at 15*s.* per cwt. .	1	10	0			
				43	10	0

Expenses of Manufacturing an Acre of Flax ready for Market.

	£.	s.	d.	£.	s.	d.
Cost price of 1 acre	16	0	0			
Pulling	0	15	0			
Stacking	0	5	0			
Tying-up and stacking . . .	0	12	0			
Taking off the seed	0	8	0			
Steeping, capping, &c. . . .	1	10	0			
Turning caps, &c.	0	5	0			
Tying-up, &c.	0	5	0			
Bleaching and turning . . .	1	15	0			
Tying-up and carting home . .	1	0	0			
Scutching 7 cwt. at 20*s.* . . .	7	0	0			
				29	15	0
Profit to the manufacturer .				£ 13	15	0

On the Courtrai System.—March Bleaching.

Value of an Acre of Flax when Manufactured for Market (Scutched).

	£.	s.	d.	£.	s.	d.
7 cwt of Flax at 8*l.* per cwt. . .	56	0	0			
2 cwt. of fine Tow, at 20*s.* . . .	2	0	0			
				58	0	0

Expenses of Manufacturing an Acre of Flax for Market.

	£.	s.	d.	£.	s.	d.
Cost price of 1 acre of Flax of the best quality	20	0	0			
Pulling	0	15	0			
Stacking	0	5	0			
Tying-up and stacking . . .	0	15	0			
Taking off the seed	0	8	0			
Steeping, capping, &c. . . .	1	10	0			
Turning the caps	0	5	0			
Tying-up and stacking . . .	0	15	0			
Bleaching, turning, &c. . . .	4	0	0			
Tying-up and carting . . .	1	10	0			
Scutching 7 cwt. at 25*s.* . . .	8	15	0			
				38	18	0
Profit to the manufacturer .				£19	2	0

Land Rents in Belgium.

In the flax districts of Belgium the rents have been, of late years, considerably augmented; and I believe, from information I have received, that an acre of flax may, at the present time, be grown as cheap in England as in Belgium. The manufacture would cost a little more in this country than in Belgium, but this would be compensated in having a market *at home;* instead of which, the Belgian flax manufacturer must seek a market in this country for his production.

Soil requisite to grow Flax.

Good flax can be grown on various soils, even on land where scarcely anything else can be grown. However, the best soil to produce a fine strong silky fibre is a sound dry deep loam with a clay subsoil.

Preparation of the Soil.

It is of great importance, in the culture of flax, that the land be well drained, and repeatedly and carefully cleansed from weeds, and thus rendered of the finest, deepest, and cleanest nature, in order to facilitate the penetration of the roots, which often go to a depth equal to the length of the plant above ground. A light ploughing immediately after harvest is required for all sorts of soils, but heavy stiff soils require to be laid in ridges before winter, and to remain till a fortnight before sowing, when it requires a very deep ploughing. But light soils must have their last ploughing in October, or before winter sets in. If the land is not sufficiently rich, liquid manure, or rape-cake powder, should be spread over the land before sowing the seed.* The land should

* Such artificial manures as guano, bone-dust, &c., cannot be recommended. Recent experiments have proved that such manures will cause the plant to grow rapidly, but producing a very weak and coarse fibre. It should be understood that *strength* is the most indispensable quality that the fibre must possess; without a certain strength, the other qualities are of very little value, and it will be satisfactory and encouraging to the English flax-grower to know, that in 1843 I manufactured, on my own account, several parcels of flax grown in Norfolk, some of which were heckled and spun by the Messrs. Marshall and Co., of Leeds.

These gentlemen, in a correspondence, stated that this flax possessed a strength almost surpassing that of any other country.

be harrowed and rolled, so that it may have all the appearance of a garden.

Sowing the Seed.

Riga seed is particularly adapted to produce a good quality of fibre.* Dutch and American seed are apt to bring forth a branchy coarse stem.

Sift the seed clear from all weed-seeds; it will save a great deal of trouble afterwards. The seed is sown in the beginning of April.

Home-saved seed, the produce of Riga, will produce finer and better fibre than the direct Riga seed; but to use it more than two successive years will not be profitable for sowing. Three bushels of Riga, or two and a half bushels of home-saved, is the necessary quantity of seed required for an English acre.

It is better to sow too thick than too thin, as with thick sowing the plant grows long and fine, instead of which, thin sowing produces a coarse branchy stem with much seed, but a very inferior quality of fibre. It is of the

* The botanical name of the flax produced from this seed is *Linum usitatissimum*, and it bears the following marks:—

Stem, slender, from 30 to 36 inches high; lower leaves, short and blunt.
Flowers, several, in a corympose pannicle, large petals, sky blue.
Filaments, united at the base.
Styles, blue, thinner towards the top.
Seeds, elliptical, polished.

There is a great variety of different flax-plants, such as *Linum angustifolium*, *Linum perenne*, &c.; all of which differ much in stem, leaves, flowers, &c., from *Linum usitatissimum*, this being the only sort which produces all the required qualities in the fibre.

greatest importance that the seed should be sown very even, the thin spots producing coarse fibre and the thick spots fine fibre; the separation of which causes difficulty and expense in the pulling, and, unless the coarse and fine be separated, the quality will be very inferior. However, by even sowing, all these difficulties can be avoided. After sowing the seed, cover it *across* with a seed-harrow, as this makes it spread more equally, and avoids the small drills made by the teeth of the harrow. Lastly, roll it with a light roller. The seed should be covered about an inch deep.

When the land is properly drained, it should be sown quite flat, without any furrows.

Sowing clover and grass seed with flax is always injurious to the flax-plant.

Weeding.

If care has been taken to cleanse the land and the seed, few weeds will appear; but if there be any, they must be carefully pulled, or weeded out. It is done in Belgium by women and children, who, with coarse cloths round their knees, creep along on all fours. This injures the plant less than when walking or trampling upon the tender young plant. Care should be taken that this process be completed before the plant has reached three inches in height.

Courtrai System.—Pulling.

In Belgium the seed is often totally or partly sacrificed to secure a pure fine silky fibre. However, flax must have come to a certain maturity before it has obtained its

natural strength (the strength of the fibre being a most essential quality). If pulled too early, the fibre will not possess its natural strength, and, if pulled too late, the fibre will lose its silky-like texture. When the stalk or plant begins to appear yellow as far as about half its height from the ground, it is about time to pull the flax; but no fixed sign or rule can be given with surety, to test the pulling-time. For at the pulling-time the plant is sometimes affected by a sort of spot, which is most pernicious; it is called in Flemish, *honing dauw;* in French, *miellure.* There are black and reddish spots, the latter giving a tint to the fibre that never will bleach out; and the whiter the yarn and linen from such flax are bleached, the more distinctly these spots will show themselves upon the manufactured article: and, to give an idea of the great loss that can be caused by having the flax affected by these spots, it may be stated that one yard of cambric or fine linen that might have been worth 5*s.* per yard, would not be worth half that price if stained in this manner.

The spots first make their appearance on the top of the plant; and immediately that is the case, no time should be lost in pulling the flax, without regarding the other signs by which the pulling-time is indicated. Let there be a distinction made between the reddish and black spots, as the latter are very little injurious; they will be removed by the screper or heckle.*

* The enormous prices obtained for flax in Belgium the last 20 years has induced many flax-growers to force the growth of it, by sowing oftener than once in seven years; and this in many instances causes flax to be affected by dead stalks some days before it is fit for pulling, and this also accelerates the pulling-time, when the dying is considerable, because it causes an impurity of colour to the fibre which cannot be removed or extracted without much difficulty and expense.

When any of the crop is lying and suffering from wet, it should be pulled a few days sooner and kept by itself. Also, if fine and coarse flax be found in the same field, pull and steep it separately; as the coarse flax, and what has been lying, will not endure the water so long as a fine straight flax.

It is of great importance that flax should be pulled evenly, like a brush at the root ends; the difference there is in the expense of doing this process neatly and carefully, to that of roughly, is but trifling in proportion to the benefit there is derived by the manufacturer and spinner in doing this process with every care and attention.

The flax is pulled in handfuls and laid flat on the ground, the top ends being laid by the root ends, in order to prevent the entangling of the bolls: there it remains for seven or eight hours.

Setting up to Dry.

Two men begin to set up closely together the handfuls in the form of the letter A. The handfuls are handed to the men by little boys or girls; as the men must go on setting up on each side in the manner described, without leaving till they have set up a length of about eight feet. This process is called in Flemish *vlas hagen*.

Tying up and Single Stacking.

The flax, after having stood in that position for seven or eight days, is sufficiently dry to be tied up in bundles of about 20 inches in circumference, yet the seed will not be sufficiently dry to be stacked or brought into the barn.

But the reason for tying it up before it is fit to go in a large stack or barn, is to preserve its bright colour. The bundles are, therefore, laid flat upon wood in single rows, about 6 feet high and 10 feet long. The top is covered with straw. This is a process called in Flemish *lvas mitten*. After the flax has remained a fortnight longer in the field in that position, the seed and flax are then in a good state to be taken into a barn or large stack.

Taking off the Seed.

This process is often performed in the winter months: it is done with flat beetles, called in Flemish *boot hamers*. The sheaves are untied and spread upon the floor in a double row; the top ends coming close together, in order that the ends may always remain in their even condition; the men then strike the bolls with a beetle till they are broken: the sheaves are then turned and the same operation repeated.

The flax is then well shaken, a few stalks at once, to cleanse it from its leaves and dust, and is then again tied up as before, in bundles.

Steeping.

On the Courtrai System.

This process requires the greatest attention and care. To obtain a white bright colour, flax must be steeped in running water; river water is the best. On this system flax is either steeped in September the year it is grown, or in June the year after. The commonest quality is steeped the same season, and the best quality is kept over

for the next year. Much nicety is required in preparing the flax for this peculiar process. The sheaves are untied; the flax is shaken over, a few stalks at a time, in order to remove all dust, leaves, or weeds that remain or have accumulated in it since the time the seed was taken off. If this be neglected it will injure the bright colour. Two sheaves are then tied together with three ties; one sheaf being tied with the top end to the root end of the other, that the bundles may come even for stowage in the crates. The bundles are set erect in the crates, and as close as possible, in order that the current of the water may not wash away the fibre. The crate when filled is flooded in the water or river. It is then covered with boards, and sunk with stones two or three inches below the surface. In two or three days there is fermentation, and more stone must be laid upon it, to keep it below the surface After a few more days the flax will daily sink in proportion as it is going on steeping, and, consequently, stone must be taken off in proportion; and the flax should always be kept two or three inches under water. The crates or frames used in Belgium are about 10 feet long, eight feet wide, and three feet high, and they are made from wooden laths; consequently this method of steeping can only be practised where the water has about five feet of depth.

Taking the Flax out of the Water.

This is the most peculiar process connected with the preparation or manufacture of flax for the market. If left a few hours too long in the water, the strength, the most essential quality of the fibre, will be lost; if taken out too soon, it diminishes the quality of the fibre, and a great difficulty is experienced in the scutching. Flax can

be sufficiently steeped in six days, but sometimes it will require twenty days; it entirely depends on the temperature of the air, and the quality of the flax: for instance, flax that is very coarse, or has been lying, will not endure the water so long as a fine, straight, good quality of flax. Also, when flax has been pulled greener than is usually done, through circumstances described in the "pulling instructions," it will not bear the water so long as flax that has arrived at its proper maturity.

When the stones are nearly all removed, and the flax keeps a level with the water, it is a sign that it is almost steeped enough; and the best test to discover whether it is sufficiently steeped is the following:—

Break a stalk of average thickness about four inches from the root end: pull the fibre gently towards the top end, and if it pulls off freely for a length of 10 inches without the fibre adhering, or at least very little, to the wooden part, it is a sign that it is sufficiently steeped.

Make this trial every two hours; for sometimes the change is rapid. There are other signs by which persons of long experience are guided in this delicate point; but they are so numerous and complicated, that even the clearest explanation of them would only tend to puzzle the grower or manufacturer, and perhaps lead him astray. When sufficiently steeped it is brought upon the bank one bundle at a time, and set up as erect as possible, the same as it stood in the crate. The fibre is exceedingly tender when in a wet state; it must therefore be handled with great care, as great damage may be done by handling it roughly.

After being thus taken out of the water, it remains there for six or eight hours.

Drying.

The bundles are now removed to the next meadow or pasture; the flax being still in a wet state, everything must be done with great care.

The bundles are laid out in the meadow, and separated in about eight handfuls, and, for regularity, laid in rows. Women follow and set it up in caps, called "Kapellen;" after two days the caps are turned inside-out, and after two more days it is fit (if the weather be fine) to be tied up again, and stacked till the following March, when it is bleached. However, when the quality is not very superior, it is bleached immediately after hay-season is over.

Summer Bleaching.

Short, thick, clean pasture-grounds are required for this operation. The flax is spread in straight lines, leaving a distance of about four inches between each line. The flax is spread about a quarter of an inch thick; bearing in mind that everything must be done with the greatest care, to lay it nicely, and to keep the root ends as even as a brush. In dry weather it remains on the grass from twelve to fourteen days. In wet and warm weather it remains sometimes for only four or five days. In dry weather it is turned every three days, in wet weather every day. The object of bleaching is to obtain a bright white yellow colour; and in very warm weather, a few hours too long on the grass may entirely spoil its colour. The moment, therefore, a few blue spots make their appearance on the fibre, it is quite time to lift it from the grass, and set it up in caps to dry, the same as when it came from the steep. But in very dry weather it

can be taken from the grass and tied up at once, without setting it up in caps; in this case, however, it should be turned on the morning of the day in which it is to be lifted; but, if not perfectly dry, let it be set up in caps till a very fine day comes, to tie it up in a very dry condition. It must be understood, that once the flax is lifted from the ground, the colour will not be affected by the wet weather, if even it had to stand for several days before it could be tied.

It is tied very evenly and neatly into bundles, with two ties, and is carried to the establishment, it being ready for scutching. The flax intended for summer bleaching should be steeped a little more than the portion intended for March bleaching; because, in summer, it cannot remain long enough on the grass to soften without spoiling the colour; whilst, in March, it can remain on the grass sometimes seven or eight weeks without injuring the colour at all; and, during that time, flax steeped too little will become properly soft for scutching.

March Bleaching.

It is the best quality of flax which is kept to go through this process; it is spread on the grass two years after it has been grown. One year after it has been steeped it is spread very regularly, and is turned every four or five days. It remains on the grass from four to six weeks, and lifted when it has attained a bright, whitish, yellow colour; and as soon as any small blue spots are seen upon the fibre, no time should be lost in lifting it from the ground, and setting it in caps till it is perfectly dry, to be tied up in bundles and carried to the establish-

ment. Another process is sometimes necessary to secure it an even bright colour, and it is—to spread it over again after it has been eighteen or twenty days on the grass. By this is understood, to shake it over without lifting it from the grass, but making the same movements as when first spreading. The object in so doing is to lift it up in order that it may be more regularly exposed to the atmosphere.

Turning.

This process is performed with a slightly curved rod, about nine feet long, and an inch and a half in diameter. The rod is passed under the flax towards the top end, and then gently turned over, thus going along the whole of the lines. This process should be performed about the evening, in order that the night-dew may press it down a little, and thus it will not be so liable to be taken up by the wind and thrown into an irregular condition, which is often the case. Turning it after rain, when partially dry, is a good plan, but not immediately after rain, when it is thoroughly wet.

Lin Ramé (*Sticked Flax*).

In the environs of Tournay, Belgium, there is a sort of flax grown of a most superior and exquisite quality. In favourable seasons it is sold (in the green state, before pulling) at from 50*l.* to 60*l.* per acre. It is from this quality of flax that is made the very superior Brussels lace. To obtain such a quality of flax, no trouble nor expense is spared; although the expense is nothing, when compared with its great increase of value.

The land for this purpose is prepared like a garden plot, having been fertilized and enriched for several seasons previously. The seed used for this purpose is the best Riga. Five bushels are sown to an English acre. After the seed is sown it is then "Ramé" (sticked); that is to say, the field is overspread with branches of wood.

This process is done in the following manner:—

A series of four or more short props, having two sprays or prongs, are driven into the ground, forming squares; upon these small props, poles are laid at a height of about eight inches from the ground; and again, on these poles, thus disposed, branches of small-wood are placed;* the object of which extraordinary process is to keep the flax from falling upon the ground; which must inevitably be the case without this precaution, in consequence of the great pliancy and delicacy of the plant, which often grows to a great height.

The flax is pulled as soon as the seed begins to form itself, and therefore the seed is entirely sacrificed. The handfuls, when pulled, are set in circles about five feet in circumference. Poles are previously driven into the ground, forming centres, around which the handfuls are

* I believe that there would be great economy and saving of trouble by having thin ropes spread across the field instead of the wooden branches.

In April last I was invited by the Earl Talbot to look over several fields then in preparation to sow flax near Ingestrie Hall, and on a very small garden plot we tried an experiment in covering it over with coarse nets; but single ropes crossed over the field, forming as it were a sort of net, would be better, as it would be easier to place and remove these ropes than heavy large nets. Certain it is, that flax could be extensively grown on this peculiar method if it were not from the great inconvenience that is experienced in procuring large quantities of these small branches of wood.

set erect; upon the top of the poles are placed caps of straw, which, spreading downwards, cover the whole of each circle from exposure to the atmosphere, thus forming, as it were, a series of small huts. In five or six days it is tied in small bundles. Although the flax has been pulled very green, yet it has always a little half-formed seed which must be taken off—not for its value, but because the flax must be cleansed from all its chaff, dust, and leaves; and in order to remove with greater facility every particle of dust, &c., it is exposed on fine days to the sun, either in caps or laid on the ground, and rubbed a few stalks at a time, and then bleached on the grass three or four days immediately before steeping. It is steeped when the water is at least 50 degrees of heat. When taken from the water it is set up in caps to dry, and, when dry, it is again spread on the grass for three or four days, after which it is tied up in bundles and sent to the establishment to be scutched and screped.

The latter process is one of the greatest nicety and peculiarity: it is first half scutched, and then screped with an iron screper, and finally brushed.

This flax is worth from 300*l.* to 350*l.* per ton. There is only a small quantity grown and manufactured by this peculiar method; and there is often a great scarcity of it. It is estimated that, when one ton of this flax is manufactured into superior Brussels lace, it produces 60,000*l.*

Gentlemen farmers would find it a matter of great amusement to try experiments in growing small quantities of this beautiful plant, and especially so when the above process is adopted. The experiment on a small scale would also be the means of practically acquainting those who feel inclined to become extensive growers with its nature and manifold advantages.

Blue System.

Pulling in the Blue Districts.

The Flax in the Blue Districts is not generally pulled so early as in the West Flanders and French Flanders, where it is intended to come under the Courtrai system. Not so much attention is paid to obtain that purity of colour in the blue flax as is for the white. Yet, although the impurity of colour does not show itself so much on blue flax as on the white, it will be visible when the manufactured articles are bleached, should the fibre have been affected by those spots mentioned in the directions for pulling on the Courtrai system.

The flax under this system is pulled when the bolls begin to change from green to a pale-brown colour, and the stalk has become yellow for about half its height from the ground, and when the plant begins to lose its leaves from about the third part of its height from the ground. In fine bright weather the flax will not be so soon affected by any impure colour as in foggy or wet weather.

Coarse and lying flax should also be kept separately, for the same reasons stated under the directions for the Courtrai system, bearing in mind that the greatest care and attention are paid to keep the ends as even as a brush in pulling.

Rippling,

" Which should be carried on at the same time, and in the same field, with the pulling.

" If the only advantage to be derived from the rippling was the comparative ease with which rippled flax is handled, the practice ought always to be adopted.

"But besides this, the seed is a valuable part of the crop, being worth, if sold to the oil-mill, 3*l.* per acre, and if for feeding stock of all kind, at least 3*l.* per acre.

"The apparatus is very simple: the ripple consists of a row of iron teeth screwed into a block of wood.

"This implement is to be taken to the field where the flax is being pulled, and screwed down to the centre of a 9-inch plank resting on two stools. The ripplers may either stand or sit aside at opposite ends, and be at such a distance from the comb as to permit of their striking it properly and alternately. A winnowing cloth or sheet must be placed under them to receive the bolls as they are rippled off, and then they are ready to receive the flax just pulled. The handfuls being placed diagonally and bound up in a sheaf, the sheaf is laid down at the right hand of the rippler and untied. He takes a handful with one hand about six inches from the root, and a little nearer from the top with the other.

"He then spreads the top of the handful like a fan, draws the half of it through the comb, and the other half past the side; and by a half turn of the wrist, the same operation is repeated with the rest of the bunch.

"Thus the flax can be rippled without being passed more than once through the comb.

"He now lays the handful down at his left side, each handful crossing the other, when the sheaf should be carefully tied up and removed. The object of crossing the handful so carefully after rippling, when tying up for the steep, is, that when taken to be spread out on the grass, they may part freely from each other, and not interlock and be put out of their regular order, as otherwise would be the case.

"If the weather be dry, the bolls should be kept in the

field, spread on winnow cloths, or other contrivances for drying; and if turned from time to time, they will win. Passing the bolls first through a coarse riddle, and afterwards through fanners, to remove straw and leaves, will facilitate the drying. If the weather is damp, they should be taken in-doors and spread out thinly and evenly on a barn floor, or in a loft; leaving windows and doors open to allow a thorough current of air, and turned twice a day. When nearly dry they may be taken to a warm kiln (taking care not to raise it above summer heat) and carefully turned until no moisture remains. By the above plan of slow drying, the seed has time to imbibe all the juices that remain in the husk, and become perfectly ripe. If it be taken at once from the field, and dried hurriedly on the kiln, the juice will be burned up, and the seed will become shrivelled and parched, little nutritious matter remaining. In fine seasons the bolls should be always dried in the open air, the seed thrashed out, and the heaviest and plumpest used for sowing or crushing.

"The light seeds and chaff form a wholesome and nutritious feeding for cattle.

"Flax ought not to be allowed to stand in the field. It should be rippled as soon as possible and carried to the water at once."

Blue Steeping.

"The process of blue steeping also requires great care and attention. River water is the best. If spring water is to be used, let the pond be filled some weeks previous, that the sun and air may soften the water. That containing iron, or other mineral substances, should never be used. The flax must be placed in the pool in one layer,

somewhat sloped, and in regular rows, with the root end uppermost. Cover with stone or moss sod."

The test to ascertain if the flax be sufficiently steeped is the same as resorted to on the Courtrai system. Under this system, however, there are various other signs and tests by which experienced fabricators are guided, but they are too numerous and complicated. The best, the simplest, the safest criterion, is the one before stated. Make this trial every two hours after fermentation subsides, for sometimes the change is rapid. Have the flax carefully handed upon the banks by men standing in the water, always recollecting that the fibre is exceedingly tender when in a wet state, and that great damage may be done to it by rough handling.

Spreading.

Select also, if possible, clean, short, thick pasture-land for this operation. Spread the flax very evenly and equally about half an inch thick on the ground. When it has been spread two or three days on the grass, it is very easy to discern if it has been steeped too much, sufficiently, or not enough.

If steeped rather too much, five or six days on the grass are sufficient. If steeped properly, about ten days on the grass is the required time. However, much depends on the weather. If not sufficiently steeped, twenty or twenty-five days will generally obviate this; and should this long period on the grass not have brought it to its proper softness, it must be steeped again, remaining in the water as long as before, unless the water possesses a greater degree of heat or cold. The same method of testing the

steeping must again be applied, and after being taken out of the water a second time, must undergo the same process of spreading, &c., and be left again on the grass from six to ten days.

In many cases flax improves considerably in softness and colour by a shower or two of rain, and should, in many instances, be left on the grass till it has been washed in that manner.

Turning.

This process is done with a rod about eight feet in length, and one inch and a half in diameter. The flax is to be turned every two or three days in wet weather (but never turned immediately after rain). In fine weather every four or five days is sufficient.

Lifting.

"A good test as to its being ready to lift is to rub a few stalks from the top to the bottom, and when it breaks easily and separates from the fibre, leaving it sound, it has been long enough on the grass. But the most certain way is, to dry a handful, and to scutch it. In lifting, keep the lengths straight, and the ends even, otherwise great loss will occur in the scutching. Let it be turned the day that it is to be lifted, as it cannot be too dry before it is tied up in bundles and taken to the establishment to be scutched."

Dew Retting.

There is another way of preparing flax for scutching without steeping. After the seed is taken off, the flax is

taken to a grass-field, and spread about half an inch thick, in December, where it remains from six to eight weeks, according to the weather; the wet decomposing the wooden particles sooner than dry weather. During this period it is turned several times. This process is particularly recommended for a coarse quality of flax, the expense being much less than steeping in water.

Scutching.

In Belgium the flax is all scutched by hand, it being far superior to that scutched by mills.

However, through the premium granted by the Irish Belfast Flax Society, many improvements have been introduced in the machinery of scutching-mills. The best machinery that was invented during my engagement with the Royal Flax Society was that of Mr. Montgomery, Grove Mill, Belfast; and that of Mr. Hutchinson, of Market-hill, which can be very much recommended.

Discoveries and Inventions in Steeping.

Since the last two years I have devoted my leisure time to making new experiments and discoveries in steeping and bleaching flax by a chemical process, and I have thus far succeeded that I have steeped and bleached flax in the short time of two days, an operation which otherwise lasts from twenty to forty days; yet the advantages of this invention would not seem to compensate for the extra expenses connected with this new process; besides, it is a question whether it would be practicable on a large scale, and I do not wish, therefore, to recommend or to give any

information upon a subject which is likely not to answer the purpose of the flax-growers.

The best practical and methodical invention for steeping flax that I ever saw is the establishment of the Messrs. Marshall, of Leeds, lately erected at Patrington, near Hull.

On this method the flax undergoes almost all the same preparations for steeping as at Courtrai, but, when stowed in the boxes, the flax is then overflown with water heated by boilers, which water is constantly passing through the boxes, like the stream of a river.

Having been requested by Mr. Arthur Marshall to examine some flax steeped on this new method, I shall only say, that the flax, although steeped in water of 70 degrees of heat (if I recollect right), yet possessed all its natural strength ; and its colour was pretty fair.

This establishment is decidedly admirable for its systematical arrangements and extensiveness, and the greatest advantages of it are, that flax can be steeped as well in winter as in summer.

The "Times," in its agricultural report of January the 2nd, gives the following account of what is going on at Patrington with regard to flax :—

"At the entrance to the farm Mr. Arthur Marshall, of Leeds, has erected extensive works for the retting and scutching of flax. In these he at present manufactures the crop of 300 acres, but the works are sufficient for 500. The farmers of Holderness, however, do not seem to go very readily into flax culture, and Mr. Marshall is therefore obliged to hire the land, sow the seed, provide people to weed and pull the crop, and the farmer then carts it to the works, where it is stacked till required. For the use of the land Mr. Marshall pays 8*l.* an acre, the farmer

undergoing no risk of failure of crop, and no outlay for seed or labour. The average yield of dressed flax per acre is five hundredweight, at present worth 70*s.* a hundredweight, besides two quarters of seed, worth 50*s.* a quarter. The employment given in these works, and in the extensive improvements at the farm, has raised the rate of wages for men, women, and children, in the parish of Patrington, from 12 to 15 per cent. above that of the surrounding district."

Factorship of Flax.

During my engagement with the Irish Flax Society I was requested by the President, the Marquis of Downshire, to give my opinion on the Irish soil as to its capabilities for the growth of flax: and, moreover, what other means and exertions (besides and above those made use of by the Society) there could be adopted or introduced to promote the improvement and extension of the growth of flax in Ireland.

In my short Treatise, which was appended to the First Annual Report of the Society, I expressed my opinion that I was convinced that it was the system of "Flax Factorship" that was alone needed to consummate the views of the Society; and which would be much more applicable to, and practicable in, England.

In fact, it is my firm opinion that, unless the farmer can sell his flax in a green state to factors or merchants, it never will be extensively grown in England, the farmer being too independent to give his attention to so many *after processes* which are required to prepare it for market.

But there exists no doubt that the farmers would at

once grow large quantities if they could be assured of finding a market in the green state. For no other crop could be grown with less trouble, or be brought to market in less time; the seed being sown in April, and the flax coming to market in the latter part of June. I am, therefore, of opinion that nothing else is wanting to induce the agriculturist to grow flax extensively, but *a market for it in its green state.* And to show the importance the Royal Flax Society attaches to this subject, *i.e.* to the introduction and establishment of flax factorship in Ireland, I will give an extract from the Committee's Second Annual Report:—

"In reference to measures alluded to in the foregoing paragraph, *one* appears to your committee of such paramount importance to the ultimate success of the Society's views, that they beg leave to lay the details of it before the meeting, to urge its adoption most strenuously, and to advise the public to embrace such opportunities of aiding the introduction of it as may be afforded by the several parties who refer to it, or who bring it forward for their support. This measure is to establish a new branch of business in the flax trade, such as exists in Belgium, termed "Factorship" of flax. It is carried on by joint-stock companies, or individuals possessing capital, who either rent land laboured by the farmer, and ready for the seed, or, when the plant is in flower, purchase the flax-crop on the foot, and at once relieve the farmer of all further responsibilities respecting it, giving him his cash in hand, or approved bills at three months; receiving no further aid from the farmer than such accommodation as may be required.

"The farmer thus has but to grow the crop to the utmost perfection that good culture, the peculiarities of

his soil, seed, and seasons will admit of. The flax factor's attention is then exclusively devoted to its after management; and the gangs of labourers employed by him soon become expert under his skilful superintendence in their peculiar branch of business, from the right system of pulling to that of the last handling required, which never can be performed or generally understood by the farmer himself; as we learn by the fact that, even in Belgium and Holland, those individuals who outstand their market, and who attempt there to treat the crops on their own account, as frequently fail as otherwise.

"The introduction of such a system would thus permanently establish among us the fullest amount of improvement that our soil and climate are capable of; and your committee have sanguine hopes that the period is not far distant when this branch of business will be taken up with spirit. Useful suggestions on this subject were given by Mr. Deman, who was himself a factor of long experience, in the Treatise last year submitted by him to the public (which was appended to the Society's First Annual Report), and have been exemplified most satisfactorily and successfully by him, this season, in the treatment of a small quantity of flax, which he had purchased on the foot, on his own account, in the neighbourhood of Moy. This flax turns out equal to the first quality of Courtrai flax imported, as proved by the price actually obtained for it, being at the rate of 18*s.* per stone, or 140*l.* per ton.

"This flax factorship (*vlas verwerker*) is called in French '*fabricant de lin.*' It is a very remunerative business; almost invariably realizing, when the business is properly conducted, 25 per cent."

Consumption and Cultivation of Flax in the United Kingdom.

The consumption of flax fibre in the United Kingdom is at present about 150,000 tons per annum; of this not more than one fourth is grown at home; thus, about 112,500 tons are imported from different foreign countries, which, taken at 60*l.* per ton, amounts to 6,750,000*l.*— Writers on flax all agree that a sum of not less than 12,000,000*l.* is sent annually out of this country for flax fibre, hemp fibre, linseed, and oil-cake. Mr. James H. Dickson, in one of his letters to the editor of "Eddowes' Journal," published in the year 1846, writes as follows:—

"It appears from the 'Irish Farmer's Journal' that the foreigner has been drawing annually from us between ten and twelve millions sterling for flax, oil-cake, and oil-seed; and it appears by the parliamentary returns up to the 5th of January, 1844, that this sum drawn by our continental friends is very little short of the whole value of manufactured cotton goods exported by us to all parts of the globe, 16,249,268*l.*; by the same returns, I observe that the whole amount of our exports in linen and flax and tow yarns, was 3,603,079*l.*; so that it follows we consume the agricultural produce from Belgium, &c., to the amount of seven to nine millions sterling, and this sum may and ought to be kept in this country, if landlords and tenants will but study their own interests. I would just say to the calculating farmer, consider the population of Great Britain, 18,800,000; deduct the inhabitants of cities, towns, and villages, who are merchants, manufacturers, and traders; then, on seeing what number you may allow to be farmers, ask yourselves how much of this

12,000,000*l.* your own share may be,—and do not forget the example you have before you in the North of Ireland, where flax-spinners declare that some of them, who have paid 40,000*l.* per annum to the Belgians, French, and Russians, for flax, now distribute those large sums annually amongst the farmers in their immediate districts."

If, however, the cultivation of flax can increase at the rate it has done for the last two years in the United Kingdom, and especially in Ireland, the happy and desired wish to keep such large sums at home will soon be accomplished; and the following extract from the last Annual Report of the Royal Irish Flax Society will prove that the epoch is not far distant when this country will grow sufficient flax for all the supply of linen and cotton manufactures in the United Kingdom.

"It is again satisfactory to note the continued increase of the flax cultivation in Ireland. From the valuable and accurate returns of Irish agricultural produce, compiled by Government, your committee learn that, in 1848, there were 53,863 acres under flax crop; in 1849, 60,014; and, in 1850, 91,040. The returns for 1851, though not as yet published, have, through the kindness of the Lord-Lieutenant, been specially made out for the Society, by the Census Commissioners, and show the very great breadth of 138,619 acres; so that the extent of the crop is, this year, nearly two and three-quarter times what it was three years ago, and probably much the greatest ever sown in Ireland.

"The average yield of fibre per statute acre, throughout Ireland, has been, on the authority of the returns, a fraction under five cwts. in each of the last three years. This year the produce is admitted to be considerably over

an average; and, taking it at five and a quarter cwts., the entire quantity of fibre on the Irish flax crop of 1851, 138,611 acres, would be 36,388 tons, which, at 45*l.* per ton, would give an amount of 1,637,460*l.* To this may be added the value of the seed that has been saved, either in the straw dried for the retteries, or by rippling, probably the produce of 20,000 acres, which, at crushing value, would be 3*l.* per acre, or 60,000*l.*, thus giving a gross total of about 1,700,000*l.* sterling as the amount realized for the Irish flax crop of this year. The quality of the fibre is much superior to that of the preceding crop, and the growers have been generally well remunerated where proper attention has been paid. It is interesting to observe that, owing to the large quantity and good quality of the home-grown crop, the imports from Russia this year are greatly less than for many previous years; and the English and Scotch spinners have been purchasing extensively in our markets."

New Modes of Steeping.

"The great interest at present excited by the culture and preparation of flax, not only in this country, but in most of the continental states, has caused persons of experience and intelligence to direct their attention to improvements of various kinds, more especially in the separation of the fibre.* Sir G. R. Farmer, Bart., of Bideford,

* There is indeed a great field open for improvement in the separation of the flax fibre and straw, and if some invention could be discovered to effect this peculiar process properly, by chemical aid, a great obstacle to the extension of flax culture would be overcome. We find that by having recourse to chemical means the strength of the fibre is more or less injured, and this deteriorates much the quality of the best flax fibre, and consequently lessens the value considerably.

Devonshire, has, for some time past, been in communication with your committee relative to a discovery by which he proposes to ret flax in ten hours. As yet, enough is not known of his process to warrant an expression of opinion on its merits, but the subject is receiving all necessary attention. Mr. Bower, of Rawecliffe, near Selby, has also submitted a very curious plan of retting in metal cylinders, by exhaustion of the atmospheric air and subsequent saturation of the straw with hot water. This is also under consideration, and your committee hope soon to be in a position to report upon it. The advantages which Schenck's system has been found to possess have not for a moment induced your committee to neglect any new invention likely to be of service; on the contrary, they have always courted such suggestions, and have given every encouragement and facility to inventors to explain their views. It is most satisfactory to find that so much attention is now being directed to this subject, and they feel strongly, that, notwithstanding all the improvements that have been carried out, much remains to be done before the preparation of flax shall have reached perfection. Most happy and important results may naturally be anticipated for the linen manufacture from the amount of skill and ingenuity which are now being brought to bear upon the treatment of the raw material."

Unsteeped Fibre.

"It has been stated that some of the spinners of yarns adapted to the coarser fabrics, at Dundee and elsewhere, could employ the fibre of flax separated by mechanical means, without steeping. Although it is evident that a much greater value can be given to the fibre by the ordi-

nary process of steeping, it may be well that the grower should have the option of preparing it in this way, either where the fibre is naturally of an inferior quality, or where, as is in some instances the case this year, no scutching machinery exists in the neighbourhood for preparing the steeped flax, and no rettery for the purchase of the straw. The cost of a machine to separate the fibre from the straw without steeping the flax is not more than 10*l.*, and such a machine could be profitably employed in the South and West of Ireland, where large quantities of flax have been grown last season, expecting to find a ready market for their produce through Chevalier Claussen's invention."

Chevalier Claussen's Invention of Cottonizing Flax.

After several careful researches on the subject of cottonizing flax, I have now become in some measure, and to some extent, an advocate instead of an opponent to flax cotton, inasmuch as it appears that inferior, as well as superior qualities of flax, can equally be converted into an article of the same value and quality (called flax-cotton). If this be a fact, and that flax-cotton can be spun upon the ordinary cotton machinery, the invention of Chevalier Claussen is indeed of the greatest value, merit, and importance; and with such an invention flax-growers need not be under any apprehension of not finding a market for their produce; because the quantity that could be consumed of flax-cotton, as a substitute for foreign cotton, is immense. But notwithstanding what I here advance in favour of flax-cotton, I must urge and strongly recommend all who are disposed to cultivate flax to adopt as

near as possible the methods prescribed in this little work, in order that it may be suitable for the linen manufacture; —remembering, that even in following these instructions one-third of all the flax grown in the United Kingdom will always fall in the class of inferior qualities, and thus be fit for cottonizing.*

I have no hesitation in stating that, if the Chevalier's new invention possesses all the expected advantages, 2,000,000 acres of flax will not suffice in future to supply the linen and cotton manufacturers of the United Kingdom. In making a partition and classification for the different manufactures, I allot and select 300,000 acres of superior quality, possessing all the delicacy necessary to manufacture such precious articles as cambric, damasks, fine linen, &c.:† besides, I select 300,000 acres for the manufacture of sewing-thread, shoemaker's thread, sail-cloth, canvas, and all sorts of strong and useful articles.‡ The 2,000,000 acres are now reduced to 1,400,000 acres, which would find a ready market in the cotton-spinners, as it appears from M. Claussen's statement that the cotton

* This remark must not lead the flax-grower to any disappointment, it being almost the same case in Belgium, where every peculiar attention is paid to secure a good crop. But what I call inferior quality is worth from 45*l.* to 50*l.* per ton; and this crop pays generally also pretty well.

† The quality of flax used for the manufacture of this article is generally worth from 150*l.* to 180*l.* per ton. It should be observed that no exertions are spared by the Belgium flax-grower to obtain that superior quality of flax, and yet he considers it lucky when he obtains one acre in four of this superior quality, which he generally sells before pulling at from 20*l.* to 25*l.* per acre (for the straw). The seed is reserved by the grower, but is sometimes partly sacrificed for the sake of the fibre, and in many instances is not worth more than 2*l.* per acre, in consequence of the crop being pulled rather green to secure a silky fibre.

‡ The quality of flax suitable for the manufacture of these articles is worth about 60*l.* per ton.

manufacturers of the United Kingdom would consume 400,000 tons of flax-cotton annually in substitution of foreign cotton.* Lancashire and Yorkshire alone would require 200,000 tons.

The great advantage which the new invention of the Chevalier possesses is, that however inferior the quality of flax may be, it can be converted into an article that can be spun instead of foreign cotton.

In a treatise on Irish soil and climate, in reference to flax, written for the committee, during my engagement with the Irish Royal Flax Society, I stated that, during fifteen years that I had extensively grown flax in Belgium, through excessive droughts, the crop, in four different seasons, did not reach more than from 10 to 12 inches in length; consequently the crop was totally lost, it being so inferior that it was quite unsuitable for the Belgian manufacture.† But since the invention of the Chevalier exists, such a crop as just alluded to could now be made useful and profitable; there is, therefore, no exaggeration in saying that the severeness of seasons, which often proves so disastrous to this delicate plant, is now checked by this invention;—and it may be once more repeated, that the

* I do not see that the cottonizer could pay more than 35*l.* per ton for flax fibre, but even then I think that flax would still pay better than wheat. However, the agricultural public are anxious to know what price the cottonizers will afford to give for flax straw, or fibre; and it is to be hoped that the most sanguine advocates of cottonizing flax will soon show themselves in the market. Thousands of acres have been grown last season in the south and west of Ireland, in consequence of statements put forward in support of the scheme; and many farmers are now anxious to see those statements realized in finding a good market for their flax.

† I strongly recommend to those who intend growing flax for the sole purpose of flax-cotton to grow it on very poor soil, where scarcely nothing else can be grown; such soils could be very profitably cultivated since the present invention exists.

greatest advantage of Chevalier Claussen's discovery consists in having found a market for an article which had no value previous to the invention.

It is but just that I should here state that, when the first notion of cottonizing flax was intimated to me, I constituted myself, without reserve, an opponent to it, saying,—"How can 1 lb. of good flax, worth 1*s.* 6*d.*, be converted into 1 lb. of flax-cotton, which is only worth 6*d.*?" and without further consideration or comment, I addressed the following letter to the 'Morning Chronicle:'—

"*To the Editor of the Morning Chronicle.*

"Sir,—I have lately seen with much pleasure in your valuable columns that you have taken a great interest in the introduction and extension of the flax industry in this country, but I really think that you would have done much more good to this important national cause, had you not advocated with so much partiality the new system of transforming flax into a substitute for cotton;—in short, converting flax into cotton is nothing more or less than reducing a good, substantial, strong article into an artificial one of 50 per cent. less value. If cotton could be converted into flax, it would be one of the greatest discoveries invented up to the present day. But to convert flax into cotton is one of the greatest *reductios ad absurdams* ever heard of. If you are impartial in this matter, you will have no objection to bring these few remarks before the public, that they may judge for themselves.

"I have the honour to be, Sir,

"Your most obedient servant,

"E. F. Deman,

"*Late Technical Instructor to the Royal Flax Society.*

"26 *George Street, Portman Square, 3 March*, 1815."

The ' Morning Chronicle' made the following interpre tation of my letter :—

" The remarks put forward by Mr. Deman in the above letter, and which would go to the complete extinction of flax culture in this country,* and the entire substitution of foreign cotton for home-grown produce, as well as the objection urged against the invention of Chevalier Claussen, by the Royal Irish Flax Society, and other persons connected either with the linen manufacture or the present mode of preparing flax, are, to our minds, most effectually disposed of in an article which appeared a few days since in the ' Cork Reporter.' The following is an extract of the article in question :—

" ' Another course may very legitimately and forcibly operate with them (the Royal Flax Society) to the disparagement of a process like that of M. Claussen. Some of the objections urged against that process may be—though we by no means say they are—just, and these objections may be considered very serious by the Belfast flax-spinners and linen-manufacturers, and yet be in reality of no practical importance as affecting the system of Chevalier Claussen. For instance, we may assume that the strength of the flax fibre is impaired by the Chevalier's treatment. This would doubtless be considered a fatal objection by the northern manufacturers, who look solely for the production of linen, one of the peculiar advantages of which is its durability. But if the new preparation can be made to supplant cotton, by being equally durable and cheap with that article, the objection becomes quite unimportant.

* The ' Morning Chronicle ' has taken a wrong notion of my letter, when he thinks that I am about extinguishing the flax culture in this country ;—from my exertions the contrary must be sufficiently proved. But that I recommend and give the preference to the culture of flax for the linen manufacturers is a fact ; and a fact based upon sound and well-founded principles.

If M. Claussen's method could not produce a fibre fit for the linen manufacturer at all, of what consequence would be the fact, provided it produced a fibre capable of being made the staple of a great manufacture, call it by what name we may? The Royal Flax Society appear to regard flax solely as the raw material for making linen or cambric. They seem to think that any preparation of it which does not best adapt it for the manufacture of these fabrics is to be discountenanced. We take quite a different view of the subject. We care not what sort of fabric may be made of the flax fibre, provided it only create sufficient demand for flax at sufficiently remunerative rates, and that it shall in itself be a great and profitable manufacture.* The products in our possession appear to us fit to be the material for several beautiful textile articles; they seem quite capable of being made to take the place of cotton, to combine with it and with silk or wool, and it is very absurd, in our opinion, to treat of them solely with reference to the linen manufacture. This our northern neighbours seem to do, and on this account, more than any other, we attach little value to their objections.'"

The 'Cork Reporter' appears to take a sound view of the flax industry, and it is to be regretted that public correspondence and intercourse should have been exchanged between the contending parties which tend more to decrease than to increase the flax culture; yet each

* Here the 'Cork Reporter' cut close to the great question connected with the Chevalier's invention, and in this single question lies the whole affair—Will the cottonizers be able to pay a remunerative price for flax? If they can, plenty will be grown for them; if they cannot, the affair loses much of its importance, as they will only have very inferior qualities of flax, such as are of no use to the other manufactures; but even then, the invention will be of some importance,—it will give value, as I have already observed, to an article which, before this invention was known, had no value whatever.

and all of us have for object in our exertions to promote the flax industry in the United Kingdom.

Flax-Growers' Experiments.

At a moment when the culture of flax is looked up to with so much interest, those who intend growing this plant will undoubtedly look forward with some eagerness to recent experiments made by clever flax-growers.

In March last I had the pleasure to be introduced to the Council of the Royal Agricultural Society of England, by one of the extensive Leeds flax-spinners, Mr. Marshall, M.P., and on that occasion the following interesting statements were made:—

Mr. Samuel Druce, of Ensham, whose property lies on the Oxford clay formation, cultivated last year 5 A. 2 R. 36 P. on a deep red loam.

Sale of Produce.

	£.	s.	d.	£.	s.	d.
Sale of flax-seed, 116¼ bushels, at 8*s.*	46	10	0			
Sale of flax-straw, 12 tons 2 cwts. 2 qrs. at 3*l.* per ton	36	7	6			
Sale of chaff, at 5*s.* per acre	1	8	7			
				84	6	1

Expenses of Cultivation.

	£.	s.	d.	£.	s.	d.
One ploughing, at 10*s.* per acre	2	17	3			
Sowing and harrowing, at 1s. 6*d.* per acre	0	8	7			
Weeding, at 2*s.* per acre	0	11	5			
Flax-seed, 13¼ bushels, at 9*s.*	6	1	6			
Rent of land, at 48*s.* per acre	13	14	9			
Taxes, at 6*s.* per acre	1	14	4			
Pulling flax, at 14*s.* per acre	4	0	1			
Carting and stacking, at 4*s.* per acre	1	2	10			
Threshing	5	7	1			
Winnowing	0	12	6			
				36	10	4
Leaving net profit to the grower				£47	15	9

Being at the rate of 8*l.* 6*s.* 2*d.* per acre.

Mr. Druce concluded his statement by expressing his conviction that the flax crop was not an exhausting crop at all; in fact, that his son had found a piece of wheat after flax one of the best wheat crops he had grown. He thought, at all events, that it would be found a good thing for every farmer to grow some flax on his farm, if only for the purpose of working up his inferior hay with a paste of beans and flax-seed, as food for his cattle.

It may, perhaps, be interesting to add, that Arthur Young, some fifty years ago, refers to the cultivation of flax in Mr. Druce's neighbourhood in the following terms:—"Eight or nine years past there was a considerable quantity of flax raised in Oxfordshire, at Water-Eaton, Hampton, and Yardington, on boggy land; and good wheat got after it by Mr. Cocks, &c.; but at present there is none. A very singular husbandry, however, in this vicinity, has been the culture of this plant for the object of seed, for the sole purpose of fattening bullocks."

The high price of linseed cake occasioned this management, which answered well; the flax was watered and dressed, as in the common way; but the object of the cultivation was the seed for live stock.*

Mr. Beale Brown made also a statement and explanation before the Council, respecting the culture and management of flax, and illustrated in a most satisfactory

* Mr. Samuel Druce, of Ensham, Oxford, has shown, at the last Smithfield Club Cattle Show, in Baker-street, a short-horned Hereford heifer, bred by himself, to which the gold medal has been awarded. An important feature in connexion with this animal is, that one of the principal ingredients of the food upon which it was fed was linseed compound. At the time when the attention of the agriculturist is so generally directed to the extension of flax culture, it is a matter of great importance to know how successfully and profitably the seed of this plant can be used. I have myself carefully inspected Mr. Druce's heifer, and it may be said that the greatest credit is due to the breeder.

manner a series of important advantages resulting from the flax culture; and Mr. Brown, it appears, has neither spared trouble, energy, nor perseverance, to promote the growth of flax in his neighbourhood, and the amount of skill and ingenuity he has evinced in this branch of agriculture and industry will undoubtedly bear its fruits.

Mr. Warnes states, that the profit upon fourteen acres of flax grown and prepared by him in 1850 was upwards of 6*l.* per acre over that of his wheat.

His figures are—

	£.	s.	d.	£.	s.	d.
Prepared flax sold at Leeds . . .	238	16	0			
Value of seed	126	0	0			
				364	16	0
Deduct cost of preparing				140	0	0
Gross profit				224	16	0
Value of produce of 14 acres of wheat at 38 bushels to the acre, at 40*s.* per quarter				133	0	0
Total balance in favour of flax over wheat, not including 6 tons 6 cwts. of husks, equal to hay, 26 cwts. of tow, and many loads of refuse for littering cattle . .				£91	16	0

I feel great pleasure in giving the above statement, the more so, because I had the pleasure of having been invited by Mr. Warnes to render my humble services to a Flax Society which was established in Norfolk in 1843, and to which Mr. Warnes acted as honorary Secretary.

Accounts from Scotland respecting the flax culture are also of a most encouraging nature.

The 'Morning Chronicle' of the 8th January last, under the head of "Flax Culture" says,—

"We understand that several farmers in this neighbourhood have resolved to lay out a portion of their fields for raising flax next season; in some instances, where the crop was raised last year, and that not from very fair land, the price realised was about 14*l.* per acre."

APPENDIX.

THE following short Treatise was written by me the first year that I was in this country, and then very ignorant of the English language; I trust, therefore, that my readers will overlook its indifferent composition. But the Society thought proper to publish it verbatim from my manuscript, in order that the sense of my observations might not be altered. I have appended it to the present work in its original form.

A TREATISE, by M. DEMAN, on the SUITABLENESS of IRISH SOIL and CLIMATE for FLAX.

As to the Soil.

Now that I have travelled in every direction through the North of Ireland, I believe I may assert as a fact, that, in every part I have visited, flax might be grown, and I saw scarce any land on which it might not be raised. I would wish, however, that trial were made in those lands the farmer judged too bad for it, as my opinion is, if the proper system of cultivation was adopted, and such land duly prepared, flax would succeed on it, and thus the most sceptic would be convinced.

As to the suitableness of Climate.

The next advantage that I observe you possess in Ireland over the people of the Continent is climate: I scarce would venture this assertion, fearing you would suppose I was exaggerating, but that your secretary is known among you, and can vouch for the truth of the remarks I am about to make.

The flax crops in Belgium are usually sown about the

beginning of April, at which period we have too generally very dry weather, so that we have much trouble and difficulty to get the land sufficiently fine moulded or broken down. Now seed, when sown on land well prepared, will spring in six days, whilst that on rough land will not grow without rain (or should there be moisture in the ground, very uneven); thus often the first crops spoken of will be three inches above ground before the other shows at all, as it waits the rain. During such dry weather in Belgium a kind of insect, called "springers," is sure to injure the crops, and a bad harvest necessarily follows. But in this country, so favoured by Heaven, you have not the inconvenience to fear, as you are sure of fertile showers at this season, which are so indispensable to the well braiding of the crop, as every one who understands the nature of it will well know. Droughts in the months of April and May often deteriorate the crops, and during my experience as an agriculturist, and latterly as a factor or merchant of flax (purchasing it on the foot from the farmers, and preparing it on my own account), I have known four seasons at different times that the crops, from the heat and the dryness of the summer, did not exceed eight inches in length.

Thus you possess advantages of incalculable value for the culture of flax from climate.

It is, however, true and proper that I should here state, that you also have disadvantages in your climate for this crop, for at the pulling-time, and for the succeeding operations, wet weather is much against the preparation of the flax, and is, undoubtedly, one of the principal causes of its inferior qualities. *But this may be all counteracted*, as Mr. S., the secretary, now understands, by the Courtrai system in this country, viz. by drying the flax in shock in the field and stacking it, and holding it over to the following spring for *steeping*, and thus the inconvenience in the climate, and its unsuitableness for steeping, and grassing, and drying may be

avoided. But as I am persuaded many of the small farmers cannot adopt this system, they should endeavour to sell their crops on the foot while yet green, some days before it is fit for pulling, as is so generally done in Belgium; and factors might be established here and there who would thus buy the crops and carry it through all the after processes on their own account, and to their profit; and thus the farmer would realise in August the value of the crop which he had laid down in April. And by this plan, with a seventh, or even a tenth part of his farm in flax, he would have the amount of his rent in pocket at once. In Belgium a farmer considers himself safe, and is at his ease, when his flax promises well, and, on the contrary, that all goes wrong when it turns out badly.

With reference to the foregoing observations, I feel convinced that, if the system is adopted in this country, flax of the first qualities may be produced, and perhaps superior to that of Belgium.

For I again assert you have the soil and climate to produce it, but you can never have any great improvement if the above project is not put in execution. It is true that some farmers of intelligence and in good circumstances may follow out the good system of Belgium, but the most part will not give themselves so much trouble (even when instructed in it): besides, it is impossible to unite all in a general system without constituting the management of flax as a separate branch of business, to be altogether conducted by persons who can entirely and devotedly dedicate themselves to it. In Belgium the management of the flax-crops, after it is grown, is reckoned quite unsuitable for farmers; even the most intelligent and better circumstanced declare it to be so for the following reasons: they cannot give the care and attention it requires throughout the summer and autumn, when they have so much on hand to attend to, and they are assured that without most particular care the result is worth nothing to them, and therefore they are induced to sell the crops green on the foot to the

manufacturers or factors, who make it their sole business, and thus can do it better than them. With large or small farmers the motives must be the same, as other produce of his farm must demand his attention and disqualify him from doing justice to this particular crop.

The Belgian farmer, should he even miss his market, never thinks of treating his flax himself, further than pulling, drying, and stacking it; and he will have it sometimes two or three years by him before he sells it, and yet it preserves very well, and even improves.

I hope I have said enough to lead some individuals to make the experiment of this system; as to myself, if a fair opportunity were offered me to engage in the business, either with a firm or a joint-stock company, I would not hesitate to do it, well assured it would succeed here as well as on the Continent if properly engaged in.

E. F. DEMAN,
Belgian Agriculturist employed by the Royal Flax Society.

Belgian Rotations of Crops.

The following tables of rotations on different soils will be useful, not only to the flax-grower, but to agriculturists in general.

No. 1.—Table of Rotations

First Year.	Second Year.	Third Year.	Fourth Year.	Fifth Year.
			Buckwheat.	Carrots.
			Oats.	Clover.
Flax and Carrots.	Rye and Turnips.	Rye and Turnips.	Potatoes, Peas and Carrots.	Oats and Rye.
			Spurrey and Turnips.	Buckwheat.
Flax.	Rye.	Clover.	Rye and Turnips.	Rye and Turnips.
Flax and Clover.	Clover.	Oats or Spurrey, or Peas.	Rye and Turnips.	Rye and Turnips.

No. 2.—Table of Rotations

Flax and Clover or Carrots.	Wheat.	Rye and Turnips.	Rye or Barley, and Turnips.	Potatoes.
			Potatoes.	Wheat.
	Oats.	Rye and Carrots, or Barley and Turnips.	Potatoes.	Wheat.
	Barley and Turnips.	Rye and Carrots.	Potatoes.	Wheat.

No. 3.—Table of Rotations

Flax.		Oats.	Carrots or Barley, and Turnips.	Wheat.
				Beans.
	Clover.	Barley and Turnips.	Rape and Carrots, or Beans.	Wheat.
	Wheat.	Barley.	Beans.	Wheat.
		Rye and Turnips.	Oats and Clover, or Potatoes.	Clover, Rape, and Turnips.
	Rape and Turnips.	Wheat.	Rye and Turnips.	Oats.

in a poor Sandy Soil.

Sixth Year.	Seventh Year.	Eighth Year.	Ninth Year.	Tenth Year.
Potatoes.	Barley.	Flax and Carrots.		
Barley and Turnips.	Potatoes.	Rye and Turnips.		
Clover.	Rye or Barley, and Turnips.	Ditto, Oats, and Potatoes.	Flax and Carrots.	Rye and Turnips.
Potatoes.	Oats.	Flax and Carrots.		
Oats or Buckwheat	Potatoes.	Rye.	Flax.	Clover.
	Carrots.	Rye and Turnips.		
Buckwheat or Potatoes, or Carrots.	Barley and Turnips.	Oats.	Rye and Turnips.	Flax.
	Rye and Turnips.	Rye and Turnips.	Flax.	

for the richest kind of Light Soil.

Wheat.	Rye.	Flax.	Clover.	
Rye or Barley, and Turnips.	Oats.	Flax and Carrots.	Rye.	Clover.
Rye and Turnips.	Barley and Turnips, or Oats.	Flax.	Clover.	
Rye.	Flax and Carrots.	Oats.	Clover.	

for a good Strong Loam.

Rye and Turnips.	Potatoes.	Wheat.	Rye and Turnips.	Flax.
Wheat.	Rye and Turnips.	Potatoes.	Rape and Carrots.	Flax.
Rye and Turnips.	Potatoes.	Rye and Turnips.	Oats or Flax.	
		Wheat.	Rye or Barley, and Turnips.	Flax.
Rye and Turnips	Potatoes.	Rape and Turnips.	Oats or Flax.	
Wheat.	Rye and Turnips.	Flax.		
Clover.	Wheat.	Rye or Barley, and Turnips.	Oats or Flax.	

Implement Drawings, &c.

Drawings of the implements requisite for the use of the different processes connected with the preparation of flax can be obtained by application to Mr. Deman.

Mr. Deman will also feel pleasure in corresponding with those who are desirous to obtain further information, which he can either give by writing, or in some cases by paying a short visit, and thus enable him to give verbal and practical instruction on the most scientific points.

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