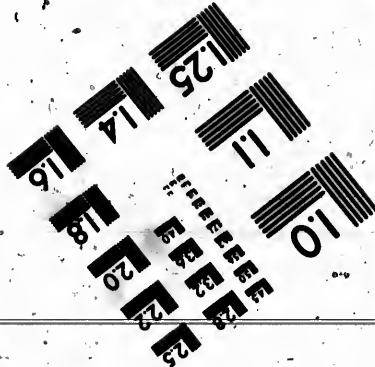
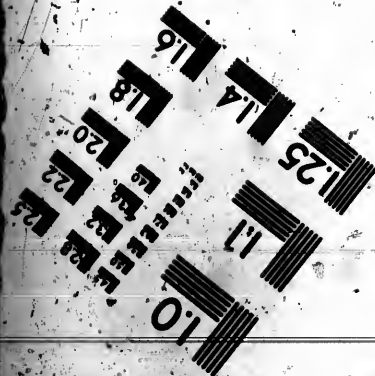
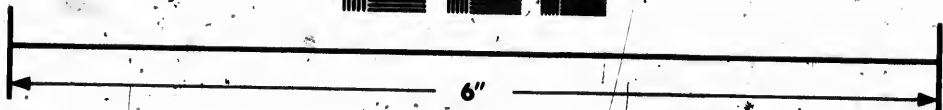
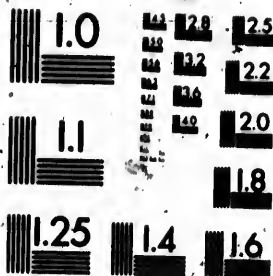


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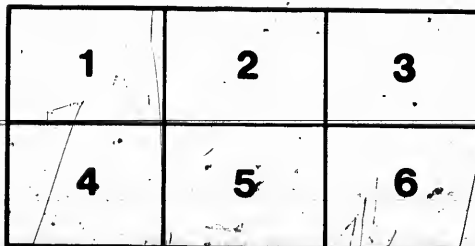
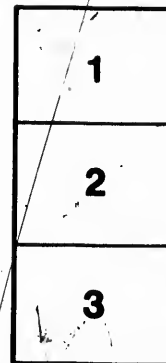
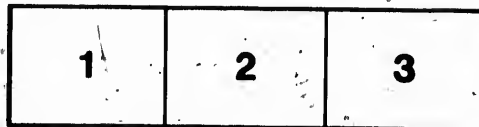
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LETTERS AND PAPERS

ON

AGRICULTURE:

EXTRACTED FROM THE CORRESPONDENCE

OF A

SOCIETY INSTITUTED AT HALIFAX,

FOR

Promoting Agriculture

IN THE

PROVINCE OF NOVA-SCOTIA.

TO WHICH IS ADDED

A SELECTION OF PAPERS ON VARIOUS BRANCHES

OF

HUSBANDRY,

FROM SOME OF THE BEST PUBLICATIONS ON THE SUBJECT

IN

EUROPE AND AMERICA.

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VOL. I.

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*Virum bonum cum laudabant majores, ita laudabant—"Bonum Agricola-  
rum, Bonum Colonum,"—amplissimè laudari existimabatur, qui ita lauda-  
batur.*

*Cato De Re Rustica*

*When our ancestors would praise any person as a good man, they thought it  
the amplest attestation of his merit to say—"HE WAS A GOOD FARMER, A  
"GOOD HUSBANDMAN."*

*ARNO.*

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HALIFAX:

PRINTED BY JOHN HOWE, IN BARRINGTON STREET.

M. DCC. XC.

5312 - August 20

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TO THE  
FARMERS AND LAND-HOLDERS  
IN THE  
PROVINCE OF NOVA-SCOTIA.

GENTLEMEN,

**Y**OU are here presented with the proceedings of a Society which was lately formed by a few public-spirited Gentlemen in Halifax, for the purpose of promoting Agriculture; also with such papers as they received, and judged to be best adapted to their delight.

The original papers written by members of the Society, or their correspondents, are not numerous; and indeed it could not be expected that a Society of this kind, in the first year of its Institution, and in an Infant Colony, could produce a large stock of original pieces. The scheme is new. Many who possess a considerable knowledge of Husbandry, have not a facility, in committing their observations and sentiments to writing; others are timid in submitting their compositions to the scrutiny of the public; and a still greater number, here, as in all other countries, accustomed to proceed in that mode of culture, derived from their ancestors, do not reflect whether it may be altered for the better; and having no knowledge of any other, are apt to consider it as the best, and resist any change or innovation. They blindly pursue a system, founded in ignorance, to their own great detriment, as experience has fully proved.

These difficulties, it is hoped, will in time be surmounted. When the first impressions of novelty are worn off, men of sense and experience will come forward in greater numbers, and communicate that practice to the public which they have found most advantageous; and as it is natural for mankind to pursue their interest, others will follow their example, and strive to share in the advantages resulting from an enlightened and judicious practice. In the mean time, to supply the defect of information, of our own growth, the Society have selected from some of the best publications in Europe and America, several pieces on various branches of Husbandry, which they recommend to your consideration.

It may be proper here to caution you against a vulgar error which prevails much, namely, that Agricultural knowledge derived from Books, is mere Theory and Speculation, without practice. For want of knowing better, some call it *Book-Knowledge*, and spurn it away as utterly useless. This notion is altogether groundless. By inspecting the present publication, you will find that the rules and directions contained in it, are the result of long and extensive practice in Husbandry; they point out the methods that have, upon repeated trial, proved most successful. In different countries, and in different parts of the same country, a great variety is found in the mode of conducting Husbandry. Some of these are preferable to others; and when they are collected, and accurately registered, the judicious Farmer can select the best, and adapt them to his own particular soil and situation. Hereby he avails himself of the experience of others, and avoids the errors to which he would otherwise be exposed; and certain it is, that Agriculture has in this way received many of its most valuable improvements—particularly in Great-Britain, with which we are best acquainted. This will appear evident from the following brief detail, which is the more necessary, as the prejudice it would remove, interferes with the design of the Society, and will be injurious to the Province.

The first book on Husbandry in our language, was written by Mr. *Fitzherbert*, Judge of the Common Pleas in the reign of Henry VIII, and was published in the year 1534. He is called the Father of English Husbandry; being the first among us who studied the nature of soils, the laws of vegetation, and wrote on the subject. His treatise was intitled, *The Book of Husbandry*, and contained the result of his observations and practice for forty years. It kindled emulation for the improvement of Agriculture, which was in a very imperfect state at that time in England; and both stimulated and instructed people in the culture of their land.

The next writer of eminence that shall here be mentioned, is Sir *Hugh Platt*, who lived in the time of Queen Elizabeth, when Carrots, Turneps, &c. were usually imported into England from Flanders. He was reckoned the most ingenious and judicious Husbandman of that period. His *Paradise of Flora*, and his own unwearied exertions, discovered and brought into general use a great variety of manures, which were not known or thought of before.

Sir *Richard Weston*, who was Ambassador to Frederick V, Elector Palatine, and King of Bohemia, published a *Discourse on the Husbandry of Brabant and Flanders*, in 1645. The Flemings were then deemed the best Farmers in Europe; and their success proceeded from the just idea they had of Husbandry,



bapdry, which was to clear their fields entirely of weeds, and keep them in fine tilth; so as to make them resemble a garden. Sir Richard Weston explained the Flemish mode of cultivating Corn and artificial Grasses; and it is asserted that England profited in Agriculture to the amount of many millions, according, by the directions laid down in his treatise. There were several able writers on Agriculture cotemporary with Sir Richard; and these again were succeeded by Hartlib, Evelyn and other men of enlarged and philosophic minds, who zealously exerted themselves for the improvement of Agriculture, and various branches of Natural History, which are closely connected with, and subservient to it.

The present century has produced a great number of excellent writers on Agriculture. Mr. Tull shall be first mentioned. He was an ingenious man, and a good practical Farmer. He introduced, or at least promoted, the Drill and Horse-Hoe Husbandry. His Theory was peculiar, yet he realized it to great advantage. He thought that earth was the food of plants; that manure served no other purpose than to lighten the soil by the fermentation it occasioned, which enlarged the pasture for the roots and fibres of plants, and supplied them more abundantly with nourishment; and that by sufficiently pulverising the soil, the same purpose would be equally answered. Although his system was not found adapted to general use; yet it had this good effect, to lead men to see the importance of keeping their land perfectly clean, and in good tilth by frequent plowing, hoeing, harrowing, &c. It will be sufficient to mention the names of those who succeeded Mr. Tull, some of whom are alive at this day, and enriching the public with their useful writings—these are Lisle, Mortimer, Bradley, Hales, Harte, Baker, Ellis, Randal, Stillingfleet, Home, Hunter, Young, Marshall, &c. &c. These respectable characters united science with experiment and practice, for the improvement of Agriculture; and their writings, with those of various Societies instituted in Great Britain and Ireland, for the same laudable purpose, enlightened the minds of all who read them, removed the strong prejudices in favour of ancient modes of culture, and were instrumental in raising the practice of Husbandry to a state of perfection beyond that of any other country.\*

A similar spirit has for several years past prevailed in most parts of Europe, to the great advancement of Agriculture, and benefit of mankind. But the case of Sweden is so peculiar, and the effects of industry, when directed by science and judgment, are so remarkable in that kingdom, that it may be proper

\* See Harte on Husbandry—the Appendix to Weston's Treatise on practical Agriculture and Gardening—and Bath Society's Papers, Vol. II. p. 310—344.

per to give a short statement of it. Sweden is one of the most northern and barren countries in Europe. Stockholm, the capital, is nearly in the Latitude of 60 degrees—almost one thousand miles to the north of Halifax. The whole kingdom is overspread with rocky mountains and lakes, having little land capable of culture, and is subject to all the severities of so high a Latitude. But Sweden has been fortunate in producing a number of eminent men, who made great improvements in Natural History—particularly in Agriculture, and in Botany and Chemistry, both of which are subservient to Agriculture. To evince this it will be sufficient to mention the names of *Linnaeus*, *Wallerius*, *Cronstedt*, *Bergman*, and *Gyllenberg*. These men applied the principles of Science to the improvement of Husbandry; and under their directions, this most useful art greatly flourished. To encourage this and other arts connected with it, the present King of Sweden, one of the most enlightened monarchs of the age, instituted a new order of Knighthood, called the *Order of Vasa*, which is conferred on such as have distinguished themselves in Agriculture, Commerce, or Science, and is held in the highest estimation.\* The consequence of this prudent management is, that Sweden affords bread and provisions in plenty for its inhabitants, which, without those measures, must be imported from abroad, or the people would perish; and a country which we would think scarcely habitable, or worth cultivation, abounds not only in the necessaries, but in all the conveniences and comforts of life.†

It is needless to enlarge farther on this point. Agriculture, like all other arts, has its rules and principles; a knowledge of these is necessary to carry it to that degree of perfection which it is capable of; and in proportion to the knowledge and application of those principles, it will attain perfection. The notion that we should disregard those rules and principles must originate from profound ignorance, is repugnant to the common sense and experience of mankind, and would seem to imply as little reflection in those who hold it, as there is in the tree that vegetates, or in the plow that divides the earth.

Agriculture may be justly deemed the parent and nurse of  
arts

\* See *Coxe's Travels*, Vol. IV.

† Something similar to this has occurred in the Prussian dominions. The King of Prussia, (father of the late illustrious Frederick) a monarch of distinguished abilities, gave every possible encouragement to Agriculture, and made several excellent regulations in its favour. Baron *Bischoff* tells us, that the best way of paying court to the King, was by attention to Husbandry. The consequence was, that in a few years the sands of the *Marche of Brandenburg*, the heaths and morasses of Prussia, were covered with a plentiful harvest of the finest corn; and the sandy desert which extended to the very gates of Berlin, was converted into excellent land by a kind of economical enchantment. *Bischoff's Political Institutes*.

arts and commerce—the principal source of a nation's prosperity. Wherever it is conducted with energy and judgment, these will flourish; where it declines, these will decline also. The reason is obvious—Agriculture not only supplies the food, without which man cannot exist; but it also diffuses health and a spirit of industry among the mass of people. Food generally regulates the price of labour. When food is plenty, it will be cheap; and when it is cheap, labour will be the same; and then, every branch of business may be carried on with vigour. This is the case even in old, populous States, it is peculiarly so in young countries, where food must be the first object. If the inhabitants cannot raise it themselves, they must be indebted for it to strangers. Hereby the price will be unaccountably high, and raise the price of labour; hereby also their cash will be drained away, and all their profits carried off. The State that depends on others for provisions, must ever be depressed and impoverished; for it actually pays the taxes and price of labour in those other States.

These truths are plain and easily comprehended. They must strike every man with conviction; and they will account for many of the inconveniences which we feel at present. They point out the reason why our fisheries are not so profitable as might be expected, and why cash is so scarce. The former are carried on at a great expence, because provisions are imported, and therefore dear; and our cash is drained away to pay for those provisions. To expect we should thrive and become prosperous whilst matters are thus situated, would be utterly vain; and this circumstance, so ruinous to the community, is the more mortifying, as our soil, in point of fertility, is fully equal to that of the countries from which we import several articles of provisions—in many respects it is greatly superior.

These evils call for redress. To apply a remedy, and cooperate with many worthy characters among us who wish to remove them, is the sole object and design of this society. That Agriculture should not have yet attained the same degree of perfection here as in the parent State, should not occasion any surprize. Large capitals, superior skill from long experience, and cheapness of labour, are advantages which our fellow-subjects in Europe possess; but in which we are greatly deficient. We may however profit by their example, and adopt the modes of culture that they have found most advantageous. This we certainly can do; and it is past all doubt, that the same degree of industry, judiciously directed, will produce double of that which is ill directed. Though a man should toil ever so much; yet if he counteracts the laws and operations of nature, he will always remain poor, and have little or nothing in return for his labour.

Let us then for a moment examine the particulars which chiefly contribute to the flourishing state of Agriculture in Great-Britain; and then judge whether we cannot imitate and derive advantage from them. These may be reduced to the following heads:

1. A spirited industry, which extends to every branch of field-culture, and to every species of cattle. Were the inhabitants of Nova-Scotia to see the annual round of an English Farmer's labour and attention, they would be convinced that he is more indebted to his industry and judgment for success, than to soil and climate.

2. Keeping their fields rich and in good heart by manures of various sorts; such as farm-yard dung, composts, marle, lime, chalk, ashes, sand, clay, soot, woollen rags, bones &c. and applying them in sufficient quantities to those soils to which they are respectively adapted.

3. Keeping their fields in good tilth; not only making the soil light and porous by frequent plowing, digging, harrowing, and hoeing; but clearing it entirely of weeds, which choke whatever seeds are sown or planted, and rob them of their nourishment.

4. The culture of what are called artificial grasses, such as clover of different kinds, lucerne, sanfoin, burnet, &c. also cabbages of various sorts in large quantities; as well as turneps, potatoes, and carrots, and applying them to the raising and fattening cattle. By the cultivation of those grasses, cabbages and roots, the same quantity of land will support twice as many cattle; and the soil is properly prepared to produce wheat, and other sorts of corn.

5. A judicious succession of crops, by the alternate culture of grain and roots in the same field; and never suffering two exhausting crops to succeed each other. Few articles in husbandry are of more consequence to the Farmer than this arrangement of crops; hereby land is always kept clean, in good heart and tilth, and the produce is abundant; where a proper succession of crops is neglected, the Farmer's hopes will be disappointed. The courses of crops in different parts of England, are set down in the following papers; these vary in different places; but those are deservedly esteemed the best where turneps, or clover, or beans come between crops of grain; so that two exhausting crops, as was said before, do not succeed each other.

6. Great attention in the choice of seed; that it be perfectly clean, and of the best sort; and changing it often.

These are the methods by which English Husbandry has been advanced to its present high state of improvement; and here it may be asked, is there any one of them which may not be practised

practised in Nova-Scotia? Have we not the clearest proof that they may be practised with equal advantage here as in Europe? Our soil is adapted to every kind of vegetable, and is such as the most judicious Husbandmen prefer. It is in general a fourth, friable, crumbling loam; very little clay, or even stiff loam is found, except in our dyked lands. On the southern sea coast, the land in many places is stoney for some distance from the shore, which is a continued range of granite, and schistus, or coarse slate rock; but large tracts in the interior parts, consisting of a light, sandy loam, are wholly without stones. Properly speaking, we have no mountains, at least none that are high; and a circumstance peculiar to Nova-Scotia, is, that the highest ridges of land generally have the best soil. No soil produces more luxuriant herbage and crops of grass. With tillage that is any way tolerable, it yields from 20 to 30 bushels of wheat per acre, and the wheat is remarkably heavy—upon accurate trials, it has weighed 64 lb. and even 67½ lb. per bushel. No country produces better potatoes, turneps or carrots, or a greater quantity of each per acre. Flax, hemp, buck-wheat, and Indian corn, succeed well; and the cyder made in Nova-Scotia is not inferior to any in North-America.

These are notorious facts, too well known to admit of any doubt; the plain inference from them is, that if we are obliged to have recourse to strangers for provisions, it is not owing either to our soil or climate; the one is fertile, the other is healthy in a high degree. Our spring indeed is later than in countries that lie farther south; but countries which are north of us, and whose spring is later than ours, abound in provisions. The mean Latitude of this Province is 45 degrees; and there is nearly the same difference between our spring and that of New-York, for instance, which is found between the spring in Middlesex and that of Yorkshire, in England; yet Yorkshire is a fine corn country, though in Latitude 52 degrees. It may with truth be asserted, that the same quantity of land, acre for acre, in Nova-Scotia, will maintain as many people, yield as much corn, as in New-York, New-Jersey, Pennsylvania, or any of the old Colonies; and will raise and fatten more cattle.

But it will be said, that the price of labour is high, owing to a thin population, and the scarcity of labourers, and that few have sufficient capitals to carry on Agriculture with spirit. It must be acknowledged that this is very true; these are inconveniences incident to all new colonies; there was a time when this was the case of the old colonies; and from these circumstances, some interesting inferences may be deduced.

From hence appears a necessity for our Legislature, and all

friends of the Province to unite, and fall on proper measures to procure inhabitants. In the present confusions of Europe, there are thousands who would be happy to take sanctuary among us, if they were acquainted with the state of this Province, and if the means of coming over were pointed out. Had they but information that there is here an extensive country, fertile and salubrious; with mild laws, a settled Government, no taxes to be paid, full liberty of Conscience, with plenty of land that wants cultivators, besides many other natural advantages; and all this under the protection of Great-Britain; it would soon turn the tide of emigration to Nova-Scotia. The best land in the world, without inhabitants, can be of little value. It is human labour that raises its value, and draws from it the advantages which it is capable of affording.

From the above statement, it appears farther, how much it behoves the Inhabitants of this Province to cherish a spirit of industry and frugality; since hereby only they can acquire capitals to defray the necessary expence of Agriculture, and carry it on with advantage. Industry and frugality are the only means by which a young colony can possibly flourish. The nature of things, and the invariable experience of mankind incontestibly prove this. No greater misfortune therefore can befall such a colony than to adopt the manners and expensive mode of living in old, wealthy countries. What may be suitable to the one, will be ruinous to the other. It will lead to habits of sloth, indolence and improvidence; a stagnation of business, a spirit of rapacity, distress, poverty and enormous debts will be the consequence; and it will tend to destroy those principles of moral honesty, and that mutual confidence, without which it is impossible for any community to prosper.

The last inference that shall be deduced from the above statement, is an argument in favour of the design of this Society, and the expediency of adopting the improvements in Agriculture which they propose, and have been found so beneficial. Nor can any argument be more forcible or conclusive. For if the price of labour be high, it behoves the Farmer to have as much produce as possible for that labour; and experience hath uniformly evinced that by the modes of culture now recommended, the Farmer's profit has been greatly increased; the same quantity of labour has yielded double what it would have otherwise produced. Nay farther, the expence might be diminished, and the profit, by those methods, be still greater. *Ten* acres of wheat, for instance, when the soil is in good heart and in fine tilth, kept clean, and sown with good seed, in a proper course of crops; will yield more than *twenty* acres cultivated in the slovenly manner that is usual. The same may be

be said of every other article that is cultivated by the Farmer.

Thus, Fellow-Citizens, you see the design and views of the Society, and the principles on which they proceed. You must be convinced that their sole aim is to promote the public good; to excite a spirit of industry, and assist in directing that industry, so that it may be most beneficial to yourselves, and to the community at large. For this purpose, they procure intelligence of those methods that tend infallibly to augment the prosperity of a country; and then lay those methods before you. They have already imported some valuable seeds; and they will continue to import still more, as their funds will enable them. They offer premiums on articles that are deemed most important, as a reward of merit and a spur to exertion; and such of them whose situation will admit of it, are now entering on a course of experiments, to confirm and enlarge the information which they receive from others.

May they not therefore expect your concurrence and aid in prosecuting their salutary views? On you the success of their endeavours will very much depend. In vain do they lay before you the most profitable methods of culture, if you do not adopt those methods; or offer premiums, if you do not exert yourselves to obtain them. Even the bounty of Heaven in so many natural advantages, is bestowed in vain, if you do not improve those advantages, and avail yourselves of them.

But this Society hope better of you. They consider your interest and good sense as securities for your zealous concurrence. They earnestly recommend to you a trial of those particulars, before-mentioned, by which British Husbandry has been so much improved, to the great emolument of the nation. These are few in number, and within your reach; and to assist your memory, they shall be briefly recited here again—Industry; keeping your fields in good heart by manure, and in good tilth by frequent plowing, and clearing them entirely of weeds; the culture of Grasses, Turneps, Potatoes and Carrots to feed and fatten Cattle; a judicious course of crops; and attention in chusing good seed, and frequently changing it.

In a word—be industrious, be frugal, be virtuous; and then, be prosperous and happy!

February 28, 1791.

P. S. Much praise is due to several Inhabitants of the County of Hants, who have formed themselves into a Society for the purpose of co-operating with the provincial Society at Halifax in promoting Agriculture. A more decided proof of their regard to the welfare of the country, they could not give. They have enriched the following Collection with some valuable Papers. Their Plan and Regulations are judicious; and their example is highly worthy of imitation by other Counties and districts of this Province.

# PLAN OF A SOCIETY

Instituted at HALIFAX, on the 10th of DECEMBER, 1789.

UNDER THE PATRONAGE OF

His Excellency JOHN PARR, Esq; Lieutenant-Governor  
and Commander in Chief of the Province of *New-Scotia*,  
*&c. &c. &c.*

1. **A**NY person subscribing and paying one guinea, or upwards, annually, to be applied to such purposes as the Society shall direct, may be a member of the Society.
2. There shall be a general meeting of the members at Halifax, on the first Tuesday in December; and a President, Vice-President, Treasurer and Secretary, shall be then chosen to serve the ensuing year.
3. Twenty Directors shall be annually chosen at the above meeting; and those Directors shall have authority to make rules, propose premiums and establish regulations for conducting the affairs of the Society; and any six of them, with the President, or Vice-President, may proceed to business: But no person shall be eligible for a Director, unless he is a member of the Society.
4. As gentlemen in distant parts of the Province may be desirous to become members of the Society, and to promote its design, some of those, in different districts, shall be chosen for Directors: And these, if not present at meetings of the Directors, may, by letter, suggest their sentiments on any matter; and their letter is to be considered as equivalent to their vote on that subject.
5. There shall be three stated times in the year for the Directors to meet; namely, the second Tuesday in March, June and September: But the President or Vice-President may call occasional meetings at other times, as business shall require; and the Treasurer and Secretary, when present, shall have a vote at those meetings equally with other members.
6. The members shall pay in their subscriptions to the Treasurer, at or before the annual meeting in December: And the Treasurer shall make up his accounts to be laid before the Society at the same time.
7. The Honourable Richard Bulkeley shall be President—The Honourable Henry Newton, Vice-President—Mr. Lawrence Hartthorne, Treasurer—and Mr. James Clarke, Secretary of this Society; to serve respectively till the annual meeting in December 1790.

The



The design of this Society embraces a great variety of objects, and will comprehend whatever relates to Agriculture in general—the improvement of land by tillage, manures, clearing or draining—the cultivation of such grasses and other articles as may be most advantageous to the farmer, and best adapted to our soil and climate—the properest kinds of seeds, with the time and manner of sowing, and the subsequent treatment of them—the culture of fruit and other trees, as well as the raising, feeding and management of cattle, are matters that will engage the particular attention of this Society; and they will be obliged to all who are conversant in these, or any other branches of farming, for their observations; and also for information of the modes of practice, which they find to be most successful, that the Society may publish them. Thus knowledge will be diffused, and the public will derive benefit from the experience of individuals. It frequently happens that useful discoveries and improvements in Agriculture are lost to mankind for want of communication—they die with those who made them; This Society will preserve all discoveries and improvements of this kind that are communicated to them; and make them extensively beneficial by conveying them to others.

There is no art more useful or necessary than Agriculture—hereby mankind procure subsistence. “The profit of the earth is for all; the King himself is served by the field.” Experience shews that every state, possessed of an extensive and fertile territory, will flourish, and abound in the conveniences of life, in exact proportion to the industry of it's inhabitants, and their skill in Agriculture. No other instance need be adduced, in proof of this, than that of the parent state, whose wealth and power are not more owing to manufactures, or commerce, than to Agriculture; in the knowledge and practice of which, Great-Britain confessedly surpasses every other kingdom or state in Europe; and the Societies, there instituted, for promoting Agriculture, have contributed much to that superior knowledge and practice.

Their example and success should stimulate us to similar endeavours. In fertility of soil, salubrity of climate, and other natural advantages, Nova-Scotia is inferior to few countries and superior to many. The design of this Society is to awaken the attention of the inhabitants to their situation, call forth their exertions, and assist them in improving those advantages which Providence has so bountifully bestowed. Besides the information that shall be communicated to the public, from time to time, the Society will give such premiums as their funds may admit, in cases that shall be judged most likely to promote those purposes. They will also be attentive

tentive to procure from Europe, and other places, such seeds, plants, trees, &c. as may be deemed conducive to the same design. Actuated by these views and motives, they firmly rely on the assistance of all the inhabitants who possess any share of public spirit; since the greatest benefits may accrue to the Province from their united endeavours; not only by an increase of useful knowledge, of industry, and of provisions of every kind; but by a great advance in the value of lands, which is the certain consequence of the former.

An institution, which has for its object the real welfare and prosperity of the Province, cannot but meet with the most generous and liberal support; and those who have formed this Society freely invite communications upon all subjects comprehended within their extensive plan.—Such persons as incline to become members, are requested to signify the same to the Secretary, by letter, who will enroll their names, as such, upon their paying any sum, not less than a guinea, into the hands of the Treasurer. The Secretary will carefully lay before the Society every communication he may receive.—Information from gentlemen in the neighbouring Provinces, upon such matters as they may think conducive to the general design of this institution, will be gratefully acknowledged.

*Halifax, Nov. 3, 1789.*

At a Meeting of the Society for promoting Agriculture in the Province of Nova-Scotia, held, by Adjournment, at Halifax, the 17th of December, 1789;

**T**HE following gentlemen were unanimously chosen Directors for the ensuing year:

The Right Reverend Bishop of Nova Scotia,	}	Halifax
His Excellency John Wentworth,		
The Reverend Andrew Brown, D.D.		
The Honourable Charles Morris		
The Honourable Thomas Cochran,		
John Newton, Esq;	}	County of Hants
James Morden, Esq;		
Doctor William J. Almon,		
Winckworth Tonge, Esq;	}	King's County.
John Clarke, Esq;		
John Burdige, Esq;		
Elisha Lawrence, Esq;	}	The
Mr. Joseph Ellison		

The Hon. Timothy Ruggles, } County of Annapolis  
 Thomas Barclay, Esq; }  
 Edward Barron, Esq; Cumberland  
 Joseph Pernette, Esq; Lunenburgh.  
 James Bruce, Esq; } County of Shelburne  
 Isaac Wilkins, Esq; }  
 John Stewart, Esq; Manchester.

Many observations were made by the members upon the nature and design of this institution, and every argument went to prove, not only its general utility, but the very great benefits that would accrue to the farmer from the particular attention and encouragement he will experience from this Society; which, connected as it is with the general prosperity of the Province, must receive that countenance and support, that every establishment, formed on principles, evidently tending to promote the welfare of a country, will unquestionably realize, from a candid and liberal community.

The Secretary read a letter he had received from a member in the country, expressive of the high expectations he had formed of the Society, which, being approved, was directed to be published, with the sincerest thanks to the writer, for his early correspondence and assurance of a continuance.

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*To the Secretary of the Society for promoting Agriculture in Nova-Scotia.*

SIR,

**I** LATELY read, with sincere pleasure, the Plan of your Society; and, as a testimony of my cordial approbation of the institution and wishes for its success, I have sent my name and guinea to your Treasurer, that I may have the honour of being enrolled a member, according to your regulations. I never paid a guinea with more cheerfulness in my life; and were my brother farmers to view the Society, in the same important light with me, there are very few who would not follow my example.

Perhaps there was nothing more wanted in this Province than such a Society, or that could be more conducive to its prosperity. Agriculture is a science or art; like other arts, it is reducible to certain principles, and should be regulated by them. A knowledge of those principles is to be acquired by observation and experiments; and these, joined to practice, must unite in carrying this art to perfection.

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The great utility of your Society may hence appear. The settlers of a new country, like this, labour under peculiar disadvantages in all those respects. Their circumstances will not admit of making many experiments; they have little leisure for observation; their whole time is employed in procuring a subsistence by that mode of farming which chance threw in their way, and is seldom founded on right principles. Besides, different soils and climates require different modes of culture. Observation, experiments and practice only can discover what those modes are; and the united labours of many, for a series of years, are necessary to make the discovery. It is needless to say, that your Society will be highly beneficial in these particulars, and help to conduct the farmer in this new country, to the right mode of practice. Nay, it will call forth the exertions of the people, and promote that industry which is the principal requisite in Agriculture.

For my part, I glory in the name of Farmer—No class of men is more useful or respectable in society—none more independent or happier. The farmer feeds the whole community—by his labour all subsist, of whatever rank or condition. To him, commerce owes its support—the sail cannot be spread without the assistance of the plough. Agriculture is a much surer source of wealth and plenty, than mines of gold and silver. The Spaniards toil to get those metals for the farmers of Great-Britain, and other countries; but are poor themselves, in the midst of their mines.

These sentiments of the importance of Agriculture, are confirmed by the judgment and practice of the wisest nations. I am one of the few farmers who have joined theory and reading to the practical part of this most useful art; and have consulted many, who have treated of the subject. Among the writers on Agriculture, I could mention some of the most celebrated Princes, Statesmen and Poets of antiquity; and I find, that the nations which have been most distinguished by their wisdom, policy and power, have paid the most attention to Agriculture.

Agriculture was held in the highest estimation by the Egyptians; they made it an object of policy and government; and no country was richer, better peopled, or more powerful, than Egypt: In Assyria and Persia, the Governors of Provinces were rewarded, if the lands were well cultivated in their respective districts; but, if neglected, they were punished.

The peculiar regard which the Romans paid to Agriculture, is well known. Some of their greatest Generals and Statesmen were taken from the plough; and several of the most eminent families derived their names from the articles they

which their ancestors cultivated with success; such as the Fabii, Lentuli, &c. &c. To be called a *good husbandman* was expressive of the highest honour; and whoever neglected the culture of his land, was subject to animadversion by the Censor. Notwithstanding their enmity to Carthage, yet they procured a translation, into Latin, of twenty-eight books on husbandry, written by Mago, a Carthaginian; and we have, at this day, several treatises on agriculture, written by the Romans, which are deemed among the best upon the subject. In a word, their attention to agriculture was a principal foundation of their grandeur; but, when luxury had corrupted their morals, this art, like the frugality, virtue, and disinterestedness by which they rose to power, was thrown aside; and then they depended on Sicily, Egypt and Africa for bread.

The Chinese empire has subsisted the longest of any that is recorded in history; and the wisdom displayed in its policy is admired by Europeans in this enlightened period. In China, every possible encouragement is given to agriculture, which is so necessary to feed fifty millions of people—the lowest number at which the population of that empire is estimated. Among various methods to promote industry and encourage agriculture in China, one is—that the Emperor, accompanied by his court, goes every year into the field and plows; he sows the land which he has plowed; and when the grain is ripe, he reaps it with his own hand. All the nobles follow the Emperor's example; and this spirit is diffused through every subordinate class of men.

It would take up too much time to specify the steps that have been taken in modern Europe for the advancement of agriculture. I shall only observe in general, that as Europe emerged from barbarism, and literature was cultivated—as the inhabitants of any state became enlightened, saw their true interest, and adopted maxims of sound policy, agriculture was proportionably encouraged. Hence chiefly it is, that we no longer hear of those desolating famines in Europe, which formerly swept off thousands. The partial dearths that sometimes happen, through unfavourable seasons, are speedily relieved by supplies from other districts or countries that were more favoured.

Within these few years, *professors of rural oeconomics* having been established in several European universities, whose business is to teach the principles of agriculture systematically and considered as a science, great benefits may be expected from those establishments; and I would humbly beg leave to recommend the example to the attention of those gentlemen who are intrusted with the government of our public seminary. A

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*professor*

*professor of rural oeconomics, at King's College, might be of infinite service to this province.*

In Great-Britain, the most unwearied exertions have been made, for a century past, to promote this useful art. Several Acts of Parliament were passed for its encouragement. Men of the first character, eminent for their abilities, and of independent fortune, not only employed their pens, to elucidate the subject; but they also applied themselves with ardour to make experiments for its improvement. Societies were formed; and the collected information derived from the members of those societies, and their numerous correspondents was communicated to the public. Hereby knowledge was widely spread; a spirit of industry was excited; husbandry, in its various branches, was carried on systematically, and on right principles. The same measures are still zealously pursued, and with increasing success. The result is such as might be naturally expected—the farmer is amply repaid for his labour; the nation is abundantly supplied with provisions, which give a spring to commerce and manufactures; and great quantities of provisions, of every kind, are annually exported. From England, the export of wheat in one year lately was *one million, two hundred and twenty six thousand, seven hundred and forty-four bushels*; the bounty on which, amounted to 72,433*l.* besides barley, malt and rye. What a fund of wealth is this? How decided a proof of the benefits resulting from agriculture, when well conducted!

This detail may serve to evince, in what high estimation agriculture has been held by the wisest nations; and of how much importance it is to the prosperity of every country. These ideas, or such as these, were, doubtless, strongly impressed on the minds of those public-spirited gentlemen, who formed your Society. They knew the advantages of skilful husbandry, and wished their fellow-citizens might partake of them. They are intitled to the thanks of every inhabitant. There is an ample field for their exertions in Nova-Scotia; for in few countries is the assistance of such a Society more wanted, and few, where it may be of more advantage. Proceed then with ardour in your laudable design; and perfect, by patient perseverance, what you have, with so much public spirit, begun.

So far as respects myself, I shall most cheerfully contribute, all that is in my power, to forward the benevolent purpose of your Society; and it is impossible to think favourably of any man who withholds the help he can give—he must be a bad member of the community. I have much to offer, concerning agriculture; but am unwilling to trouble you with too much at one time. Should this little essay, on the general subject, meet

meet the Society's approbation, I shall hereafter enter occasionally into minuter details of matters which, I conceive, are interesting to the execution of your scheme.

In the mean time, I have the honour to be, with much esteem and respect, for you and the Society,

Sir, your very humble servant,

Nov. 25, 1789.

COLUMELLA.

All letters approved by the Society and designed for publication, the Secretary will, whenever requested, transcribe for the press, without discovering the writer's name, which, it is hoped, will remove every discouragement to a free and full communication of such matters as are comprized within the Society's plan.

At a Meeting of the Directors of the Society, January 12, 1789, the Vice President being in the chair, the following Address to the Farmers and other Inhabitants of Nova-Scotia was agreed to and ordered to be published under the signature of the Secretary.

To the FARMERS and other INHABITANTS of NOVA-SCOTIA.

THE Directors of the Society for promoting Agriculture in the province of Nova-Scotia, held an occasional meeting this day; and being desirous to extend, as much as possible, the benefits of the institution, were unanimously of opinion, that if similar and subordinate Societies were formed in the different counties and populous districts of the province, and to be considered as branches of the general Society at Halifax, it would greatly conduce to that end; for thereby information of various kinds may be collected, which could not otherwise be obtained; and a more extensive communication might also be opened between the several parts of the country.

The Directors therefore take the liberty of suggesting the following hints to assist in organizing these smaller Societies which are to co-operate with the general Society for promoting agriculture: And they beg leave to recommend them to the serious consideration of every person who feels himself interested in the welfare and prosperity of a country, which by proper industry and prudence may, in the course of a few years,

years, be brought into a state of improvement and cultivation, that will give new vigour to its fisheries and commerce, and render it a valuable appendage to the parent state, and a sure source of permanent supplies to our West-India Islands.

I. That the Director or Directors of the general Society in each county will endeavour, as soon as it may be convenient, to form a Society, consisting of such persons in their neighbourhood as are qualified to answer the purposes in view: And if there be several populous districts in a county, it will be advisable to form a Society in each; or in as many as shall be found practicable.

II. That a Director of the general Society shall act as President of each of those Societies, and that a Secretary shall be chosen for each, to take down minutes and correspond with the Secretary of the general Society at Halifax.

III. That these Societies shall form their own rules, and meet at such convenient times and places as they shall judge best for the dispatch of business.

IV. That these Societies will endeavour to procure authentic intelligence concerning the culture of the following articles in their vicinity, viz.—*wheat—barley—oats—rye—peas—Indian corn—potatoes—turnips—sarrats and horse beans*: What mode of culture for each, and what kind of seed is found to succeed best. Also, what grasses are most productive and most nutritive for cattle.

V. That whatever intelligence in these matters those Societies can procure, either by their own observation and practice or by information from others, in conversation or writing, shall be transmitted to the Secretary at Halifax, in order that such articles as shall appear useful, may be selected and laid before the public, with other transactions and communications of the general Society.

VI. With the view of prosecuting more effectually the business which the Society have in hand, and to facilitate the communications of their correspondents, they beg leave to propose the following questions; to which the different Societies, or others, will be pleased to return answers as soon as convenient.

*Questions concerning Wheat.*

1. What is the course of crops for three preceding years, and how many ploughings are used before the wheat is sown?
2. Is the wheat ploughed or harrowed in, and which answers best? And in what kind of soil?
3. What kind of wheat succeeds best? Whether bearded or bald wheat? Whether red, white, &c.?
4. Does winter wheat succeed? And in what kind of soil—whether old or new—whether light or heavy?

5. What



5. What is the best time and season for sowing winter wheat, and what for sowing spring wheat?

6. Is the wheat liable to injury by insects, and what are they? Or by smut, or blast, or mildew? And which is most subject to any of these—the spring or winter wheat?

Many of the above questions will apply to barley, oats, rye, and Indian corn.

The Society will be very cautious in recommending any new measures or alterations in the usual mode of husbandry. They will recommend none but such as experience has decidedly proved to be useful; and even these should be introduced gradually, and first tried on a small scale. For as different soils and climates require a different mode of culture, the experiments which have succeeded in other countries may not be equally successful in this province.

In the mean time, the Society wish to call the attention of all who are engaged in that most useful employment of agriculture, to the following particulars, which are necessary in all countries, and without which the farmer's labour and hopes must in a great degree be frustrated every where.

1. The farmer should be careful in choosing the seed that he sows: For instance—his seed wheat should be perfectly clean, without the mixture of any other seed whatever; it should be fair and plump; not dark or shrivelled, or of a bad kind; and he should change his seed every two or three years.

2. The soil in which he sows his wheat should be prepared and made light by ploughing or other culture; and this is more necessary, if the soil be a loam, or clay, and is inclined to be stiff. Vegetables and plants of all kinds, like animals, are nourished and increased by food: Vegetables and plants receive their food chiefly from the earth by their roots, which strike downwards for that purpose. But if the earth be stiff and hard, the tender roots and fibres of vegetables cannot easily enter and spread; in that case, they will not find much food, and the vegetable must be checked and starved in its growth. This is the reason why in England, where farming is well understood, they plough so often for sowing wheat. Unless the field be prepared by a course of crops for three or four years before, they generally give four ploughings, sometimes five: This is always the case when they sow a fallow with wheat. Hereby the soil is separated and made light for the roots and fibres of wheat to shoot out vigorously and spread for their food; and the increase of crop thereby gained, amply repays the labour, as the experience of every year demonstrates.

3. The farmer should be very careful to keep his wheat field

field clear of weeds or sprouts of trees: Weeds are nourished by the same food that nourishes wheat: all the food they get is taken from the wheat, which must thereby suffer. Besides, they shade it from the sun, which also spoils its growth. The farmer may be assured he never will have a good crop of wheat, if his field be over-run with weeds, briars, or the sprouts and suckers of trees.

These rules will apply to every other species of grain. By proper attention to them land will yield double the increase that is now got. An acre of land thus managed, and kept in good heart and tith, will produce from 20 to 40 bushels of wheat. In England, upwards of two bushels of seed-wheat are commonly sowed on an acre: In this province they seldom allow two bushels to an acre; some allow but one. It will be prudent in our farmers to allow a little more seed to their land, and observe the event.

JAMES CLARKE, Secretary.

At a meeting of the Society for promoting Agriculture, in the Province of Nova-Scotia, January 26, 1790.

The Honourable RICHARD BULKELEY, President, in the chair

**T**HE Society, from a view of increasing its members, and rendering the institution as extensively useful as possible, agreed, That any person paying half a guinea annually, to be applied to such purpose as the Society shall direct, may become a member.

It was also thought necessary to increase the number of Directors, that every part of the province may equally participate in those benefits, which, it is hoped, will be experienced from the communications that the Society, from time to time, may receive and lay before the public, upon the various objects comprehended within their plan.

The following gentlemen were afterwards appointed Directors, from a persuasion that they will cheerfully lend their aid in furthering the views of an establishment, which, if properly encouraged, cannot fail of producing the most important effects to the country in general.

The Honourable Alexander Brymner,  
The Honourable Sampson S. Blowers,  
Richard John Uniacke, Esq;  
William Thompson, Esq;  
Roger Johnson, Esq;  
J. M. Freke Bulkeley, Esq;

Halifax.

Timothy

Timothy Folger, Esq; Dartmouth.  
 Theophilus Chamberlain, Esq; } Preston.  
 Mr. Titus Smith, }  
 John Day, Esq; Newport.  
 Peter Dey, Esq; Falmouth.  
 Mr. John Johnson, } Horton.  
 Mr. Thomas Hill, }  
 Benjamin Belcher, Esq; } Cornwallis.  
 Mr. John Ellison, }  
 Mr. Robert Walker, Aylesford.  
 John Ruggles, Esq; } Wilmot.  
 Samuel Hayward, Esq; }  
 Mr. Fowler, } Digby.  
 James Moody, Esq; }  
 Mr. John Pulhemus, Clements.  
 James Delancey, Esq; } Annapolis.  
 Thomas Williams, Esq; }  
 John Crawley, Esq; } Yarmouth.  
 Benjamin Barnard, Esq; }  
 Mr. David Ogden, Argyle.  
 John Sarjent, Esq; Barrington.  
 Simeon Perkins, Esq; Liverpool.  
 John Creighton, Esq; } Lunenburgh.  
 Christopher Jessen, Esq; }  
 Jonathan Prescott, Esq; Chester.  
 James Lodge, Esq; } Manchester.  
 Wm. Armstrong, Esq; }  
 Thomas Hamilton, Esq; } Country Harbour.  
 George Dawkins, Esq; }  
 William Sutherland, Esq; } Sheet Harbour.  
 Nicholas P. Olding, Esq; }  
 Timothy Hierliby, Esq; Antigonish.  
 John Frazer, Esq; } Pictou.  
 Robert Patterson, Esq; }  
 James Fulton, Esq; Londonderry.  
 Mr. Robert Ripley, } Amherst.  
 Mr. Wm. Black, }  
 Mr. Robert Forster, Cumberland.

One of the members laid before the Society the Kentish method of preparing wheat for seed; which being approved, was ordered to be published with a request that experiments may be made in different parts of the province, and the effects communicated to the Secretary.

Put a quantity of salt water into a tub, sufficient to make it two feet deep, and add as much salt as will make it bear an egg—Have a strong wicker basket of the size of 10 or 12 gallons, in which you may wet nearly a bushel of wheat at a time

time—Place the basket in the tub which contains the pickle, and put in the wheat, keeping it stirring for about 5 or 6 minutes, carefully skimming off whatever may swim on the surface—Take the basket out of the pickle and place it on the rim of the tub, and as soon as it is properly drained, turn the wheat upon the floor, and sift over it a small quantity of lime carefully stirring it, that every part may equally partake of the lime. A greater quantity should not be prepared at a time than may be wanted for one or two succeeding days—This method is generally considered a very great, if not an entire preventive from smut or collar bags in the crop.

The Secretary is requested to inform the gentlemen by letter of their appointment, as Directors, and to transmit them the plan of the Society, with a copy of the proceedings which have been published, for their further information.

JAMES CLARKE, Secretary.

At a meeting of the Society for promoting Agriculture, in the Province of Nova-Scotia, held by adjournment from the first of March.

The President and Vice-President being absent, from indisposition, Mr. Morden was requested to take the chair.

**T**HE Secretary laid before the Society several letters he had received during its recess, which were read : That upon Compost contains the most useful information, and the Society hope to be favoured with a continuation of this gentleman's judicious observations.

The letter from a Farmer, pointing out, from his own experience, the most effectual remedy to prevent smut in wheat, the Society recommend to the farmers in the warmest manner. It proves the utility of the Kentish method, heretofore published by the society.

The society make their warmest acknowledgments to Columella, for the many judicious remarks contained in his letter of the 1st of March.

The secretary will have these letters published as soon as convenient.

The Society afterwards appointed the following gentlemen Directors, in addition to those heretofore elected.

Major Thomas Millidge,	} Grenville.
Alexander Howe, Esq;	
George Henry Monk, Esq; Windsor.	
John Taylor, Esq; Siffibou.	

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On motion by the Right Reverend the Bishop of Nova-Scotia, it was unanimously resolved, that the following premiums should be given, viz.

I. A silver medal, value one guinea, to the person who, in the province of Nova-Scotia, shall raise the largest quantity of merchantable wheat in either of the years 1790 or 1791. The claimants of this medal must produce to the Society, certificates of the respective quantities of wheat on which their claims shall be founded; and those certificates must be signed by three or more of the Justices of the Inferiour Court, at one of the quarterly sessions held in the counties respectively where the claimants reside.

II. A silver medal, value one guinea, to the person who shall, between May 1, 1790, and May 1, 1792, bring to the market of Halifax for sale, the fattest ox, or any other of the neat kind, whose four quarters shall weigh the most, and which has been raised and fattened in the province of Nova-Scotia. The candidates for this medal must produce to the Society certificates of the weight and quality of their respective cattle, and signed by the clerk of the market in Halifax.

III. A silver medal, value one guinea, to any person who shall between this time and May 1, 1792, produce to the Society the best account in writing of the Plaster of Paris, as a manure for grass or grain. The Society expect that the above account will contain—1. Directions for the best and cheapest methods of preparing the Plaster of Paris, by burning and grinding. 2. Information of the kind of soil to which it is best adapted, either for grass or grain. 3. Information about the quantity of Plaster of Paris per acre, best suited to grass or grain, and in different soils. 4. The properest season for laying it on the ground, and the subsequent treatment of the soil, to make it most productive in grass or grain. The claimants of this medal are to send their papers sealed under cover, and directed to the Secretary of the Society; not signed with their names; but dated from the village, or township and county in this province where they respectively reside.

The medals are to be procured from England in the course of the ensuing summer, and executed in the neatest manner. The time of giving them has been prolonged as above, to remove any complaint that the notice was too short and limited for the exertions of those who were desirous to become claimants.

JAMES CLARKE, Sec'ry.

To the SECRETARY of the AGRICULTURAL SOCIETY, at HALIFAX.

THE intention of the Society being so obviously of the first importance to this country, I am induced to request

that the following observations may be communicated to the next meeting.

Every day a experience evinces that our soil is good, yet, such is the coldness of the climate, that when land has been improved three or four years without manure it grows mossy, and afterwards produces but little: There are few countries, therefore, where the article of manure can be more profitably attended to, because, when well prepared, it not only replenishes the earth with food for vegetables, but by its warmth counter balances the coldness of the climate. As what has been written on this subject is in the hands of but few, I have endeavoured to bring together the opinions of the most modern authors, which from my own experience I can recommend to the practice of the farmers in this country, remarking at the same time, upon the improper use which too many make of their dung. Lime, Marl, Plaister of Paris, &c. &c. are good, and some of them perhaps the best of manures: But it is not in every one's power to procure them, especially in such quantities as are necessary for the farmer: But a **COMPOST** is within the reach of every person and almost in any quantities, and which no prudent person, upon knowing its usefulness, will ever be without.

There is perhaps no one practice in husbandry more injudicious than that of taking new dung from the yard, in the spring, and using it as a manure for potatoes, spread over the ground, or in any other way whatever, as it introduces grass, weeds and noxious plants, which more than balances any little benefit that it can possibly do as a manure when used in that unprepared state.

When new dung lies in large heaps it soon grows very hot, and a violent putrid fermentation comes on, which melts the whole into one common mass, reversing what took place in vegetation, bringing that matter which has been the substance of former vegetables into such a state that it will become the food for succeeding vegetables: But when it is put in small quantities in the hills of potatoes, or spread on the ground and plowed in, even if it had begun to grow hot and ferment, it will be immediately cooled by the surrounding earth. In order to keep alive that heat which is necessary for its putrefaction or rotting it must be kept in large heaps. Let any one spread new dung over the ground, and in a week's time, if the weather is dry, it will look little better than dry straw; he will now find it has lost more than half its weight, and with that a large proportion of its real riches. In this state I have often found it in hills of potatoes in a dry season, where it manifestly did more hurt than good; by keeping the roots from the moist earth: If after this it rots, yet it never  
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can recover that which it has lost by its rich moisture being rarified and evaporated by the sun. It should therefore be suffered to lie in some convenient place in a body together, by which means its moisture is preserved, a suitable degree of heat generated, and a universal putrefaction takes place, turning every part of it into proper manure or food for vegetables: For in its crude state it can scarcely be called a manure, but only something of which a manure may be made, because there is no part of it but what must be dissolved by putrefaction before it can yield much vegetable food; hence it comes to pass that if the season proves wet soon after it is used, it does some good, as it affords a little nourishment by being purified from the wetness of the season; but should the season prove dry, no putrefaction can place, so, that of course, it affords no nourishment to vegetables but does real hurt by keeping the ground too open and hollow in the hills where it is put. Yard dung, then, should never be used till it has been in a proper situation for fermentation and putrefaction, one year at least; by this means the seeds of grass, weeds, or noxious plants, will mostly perish, and the dung by its putrefaction, be stored with great quantities of proper food for vegetables, possessing those qualities which tend to meliorate and enrich the land. To accomplish this plan in the spring, it should be put into the place where it is intended the general Compost heap should be made. For this purpose a hollow place should be chosen; and if it cannot otherwise be had, it should be dug large enough to hold the quantity of manure intended to be made. If a place can be taken so situated as to receive the wash of the dwelling-house, cow-yard, hog-sty, &c. so much the better. It must be clayed all over its bottom and sides. Drains must be cut from the lowest part of the cow-yard, and hog-sty, into the place prepared to receive the Compost, so that whatsoever is washed out of them by rains may be carried directly into the Compost heap. All kinds of weeds from the sides of fields, where they often do much hurt, by shading and drawing the nourishment from plants that grow near them, may be pulled and thrown in: and in hoeing where the land is weedy, small children might often be employed to good advantage in gathering up the weeds after the hoers, and throwing them in heaps; by which they would be prevented from taking root again, the land would lie clean, and cart loads might in that way be gathered. Sprouts also pulled from the stubs in new ground when they are in a succulent state, before they grow woody or hard (which by the way is the best time to sprout new ground) may be thrown in heaps and carted in: Rock-weed, kelp, and all sorts of sea-weed or grass, may be carried in great quantities

quantities, where they can be had; garbage of fish, hair, blood, bones, woollen rags, oyster-shells, muscles, and every kind of animal substance, are excellent, and capable of making more than four times their own weight of good manure; ashes, such as are made by burning bushes, may all be thrown in, and it is better to gather some of the earth with them, than to leave any of the ashes, as the top of the earth in those places is often almost as much impregnated with salts as the ashes themselves; ashes that have been leached are also good; the dung in the cow-yard should be removed every morning into a heap by the side of the yard; by this means the yard is kept clean, and the dung is kept from drying, and as often as there is enough may be carted to the general heap. If the farmer has not the conveniency of a hog pasture, but obliged to keep his hogs in a sty, he will find it for his interest to throw in great quantities of green weeds, grass, &c. as it will save more costly feeding, and in this case the sty should be often cleared and its contents carried to the general heap. To a Compost heap, made of such materials, considerable earth may be added; but then it should be well chosen; any place where the wash of a road or street is brought to settle, is excellent, and mud may often be taken from settling places in a road, and dry earth put in its place, to the great advantage, both of the road and him who takes it; half a hundred loads of good loam, and even more, where there is a large yard and many cattle, may be carried into a cow-yard in the spring of the year, and be wholly carried into the Compost heap by the fall, taking off the top at several different times. In Holland and some parts of Germany, they are at great pains to save the urine of their cattle for manure, and find it of considerable consequence; by the above method it is all effectually preserved, which, together with the hot steam and perspiration of their bodies whilst lying upon the loam, so far enrich it as to render it a very valuable addition to the Compost heap. The Compost should be turned up from the bottom once or twice in a summer, which will greatly forward its fermentation and putrefaction; and towards the fall, when the seeds of weeds and grass begin to be ripe, it is best to move the Compost all to one end, that such rubbish as abounds with ripe seeds, may be put by itself and lie round to another year. At the fall, when the crops come in, considerable addition may be made by carrying in all the vines, stalks, &c. of every kind of vegetable from the garden; also, potatoe tops and turnip tops, if not wanted for cattle; these last, make a manure of a very excellent kind. All the chaff from the several kinds of grain that may be raised—every kind of damaged or rotten straw or hay, or old slack bottoms, &c. may come



come in, in the course of the year, with every thing that is capable of a quick putrefaction.

Such as can afford it will find their account in having a shed built over their Compost heap, yet it must be open and exposed to the air on all sides; for by such exposure not only the putrid fermentation will be forwarded, but much will be drawn from the air, especially if there be any ashes in the heap, which will greatly increase the richness of the Compost; yet a covering at the top will be very necessary, otherwise the rains will not only greatly check the fermentation, by too often cooling it; but will probably, when they come plentifully, cause it to overflow its banks, and carry off the rich juices of the Compost; also, without such a shed it might sustain damage by having its most subtle and volatile parts evaporated by the sun. I have indeed seen Compost heaps, without clay at the bottom or a shed at the top, but that much is lost from such a heap by all its washings in the course of the year, is too manifest to need any thing said upon it. It is true, that in this way of putting all his new dung into the Compost heap, the farmer must go a year without manure, if he has not that which is old and good by him; but when once he has his Compost heap fit for use, after that he has his manure as regularly every year, as those who follow the pernicious practice of waiting their new dung, (I can call it nothing better, for it often does hurt); and he who follows the above method, or something like it, will soon find that from one acre of land, well manured, he can raise more than he can from two without manure, so that one half his labour will be saved; the labour and pains that he has been at in making manure, will be returned with ample increase into his barn and stores, and his farm at the same time increasing in riches.

Those who have a good stock of cattle, hogs, &c. may in some such way as the above, increase their manure to almost any quantity they shall need. And such as have no cattle (and there are doubtless some such among our new settlers) may, in the above way, make considerable manure in the course of the year, from the wash of the house only; and such manure is good, and will produce cucumbers, peas, beans, &c. quicker than good yard dung. To conclude, the more any one attends to the affair of manuring his farm, the easier and more elegantly it will support him; whilst, without that, upon such land and in such a climate as we have in this country, an industrious man may, after a course of years, find that all his labour hath been in vain.

Feb. 20. 1790.

A FARMER.

To the SECRETARY of the AGRICULTURAL SOCIETY, at  
HALIFAX.

SIR,

I AM much obliged to the worthy gentlemen of your Society for the honour they did me in publishing my last letter. When a man first appears in print, he naturally feels a kind of agitation—a certain degree of complacency, mingled with anxiety for the fate of his production. This was my case; but the emotion was soon over, as I have no ambition to shine in the character of an author—my only view in writing to you, is, to be useful to my fellow-subjects, particularly to my brother farmers.

The more I reflect on the nature and design of your Society, the more am I convinced of its utility, and that it will be productive of the most salutary effects to this province. In my neighbourhood, it has been of service already; the inhabitants frequently converse now about farming, and the best methods of improving their practice. A spirit of attention to the subject is awakened, and I trust myself that correspondent exertions will follow. Every man of observation has it now in his power, through your Society, to be useful to the public; for by communicating to you the result of his own experience—the improvements he has discovered, and the errors he may have committed, in the different branches of husbandry; others may profit by it—adopting what was found useful, and avoiding what was otherwise.

To imagine however that every individual would approve of this or any other public institution, when first set on foot, would betray a very tender knowledge of human nature, and of what daily passes in the world. The prejudices of some, or even their not being the first movers, the imperfect information of others, and selfish views of many, interpose, and raise obstacles to any enlarged plan of public utility, which embraces a variety of objects. In no case, perhaps, has this been more remarkably verified than in agriculture; as every one almost has some little smattering of practical knowledge in it, which he makes the standard of perfection in this most useful art. When the use of clover was introduced in England, towards the middle of the last century, it met with violent opposition, and was reprobated by the generality of English farmers. The influence and exertions of Sir Richard Weston, Mr. Evelyn, Mr. Hartlib, and other enlightened men of that period, were scarcely sufficient to stem the torrent of prejudice, till the benefit of cultivating clover was known from experience. The use of it became general at last; and it has been avowed, that this single plant repaired in a great degree, the damages  
which

which England sustained by the destructive civil war in the reign of Charles the First.

I have heard some objections made to your Society; but they were so trifling that I am almost ashamed to repeat them. They were whispered in a low, dissident tone of voice, as if the authors (who were few in number) had been conscious that they betrayed their own weakness by hinting them. My ear was just able to catch the scarce audible hints—that we were too young for such an institution—that the fisheries should be our principal, if not only concern—and that due encouragement was not hereby given to the raising and sale of our own cattle. To state such objections, is to refute them. However, as they may influence some honest, well-meaning persons, for want of information, I shall beg leave to examine them briefly in their order; and I am chiefly induced to do this, because the result will be favourable to your Society, and throw light on the state of this country.

1. The objection, that *we are too young for such an institution* as the Society to promote agriculture, is totally unfounded and nugatory. For I would ask—if any agriculture is to be carried on among us, can it be too soon to put the farmer in the best method to increase the produce of his land? To call forth his exertions, and direct them in the way that will be most advantageous? Or is it too soon, and are we too young to open new sources of convenience, commerce and wealth which are actually in our power?—We have about *forty thousand* inhabitants in this province: Is this multitude too small, and too young to be advantageously and prosperously employed? The soil of Nova-Scotia (and I speak it from knowledge and experience) is capable, by well directed industry, not only to supply its own inhabitants with bread; and every other species of food in abundance; but also to furnish a large surplussage for exportation. Is it too soon to set about the means of accomplishing this most desirable purpose? Is it not at once disgraceful and ruinous, that when placed in so fertile a soil, we should be dependant on foreigners for bread? Or would the objectors wish to continue us in that dependance; and that we should remain in a torpid, inactive state, without any attempt to assist ourselves, when it is fully in our power.

That your Society will have a tendency to promote agriculture and industry, and thereby increase the quantity of provisions, can admit of no doubt. We have the example of every civilized country in Europe, and the success of similar Societies in each, to assure us of it. The thing speaks for itself, and carries its own evidence with it. There are many men of observation and good sense among us, sufficiently capable of assisting

assisting to carry on the design of the Society, with reputation and benefit to the province: And it appears no less absurd to assert that we are *too young* to be good farmers; than it would be to assert that we are *too young* to be good subjects, or good members of Society.

2. With regard to our *Fisheries*, they are certainly an object of moment; they should have every reasonable encouragement; and perhaps no country has greater advantages in this respect than Nova-Scotia. But improvements in Agriculture, which your Society aims at, instead of interfering with our Fisheries, will greatly assist and promote them. Fishermen, like all others, must have bread, and other vegetable as well as animal food. These articles are supplied by farming; and if we have them not of our own, they must be imported, chiefly from foreigners, and at such prices as they are pleased to put on them. We actually import most of the bread consumed in our Fisheries; and hence one cause of the high price of labour, which must ever bear a proportion to the price of provisions. The reason is obvious—no man can live without food; if, therefore the price of it be high, he must charge accordingly for his labour to support himself and his family. I am told that in the article of fish, we are underfold in foreign markets. The high price of labour must be the cause of this; and that again is occasioned by the high price of food, which is imported, and must consequently be dear; for in point of situation, as well as other respects, we have superior advantages to any other people for carrying on the fishing business. Now, it is impossible that we can ever have bread and other food cheap or plenty, otherwise than by extending and improving our agriculture; and nothing can conduce more to these purposes, than the plan and design of your Society. You are therefore essentially serving our fisheries, as well as the interests of the province at large; and how any one, who wishes well to either, can hesitate about uniting and co-operating with you, is beyond my comprehension.

3. The objection that the Society does not give sufficient encouragement to the raising and sale of our own cattle, is more groundless if possible, than the former; since the best mode of raising, feeding, and managing cattle, is one of the professed objects which it designs to promote. The advantages arising from such institutions as yours, must be the work of time and persevering exertions. But people have not patience to wait for the result; they vainly expect an immediate accumulation of wealth; and if they are disappointed, they reject the measure as good for nothing. Now, this is just as rational as if a farmer were to reprobate the sowing of grain, because

because it does not instantly spring up, and bear a ripe, full-loaded ear.

I am sensible that some farmers very much disapprove of the importation of live stock and fresh meat from the American States, and think it is injurious to them. Although this be a matter of mere political consideration, and with which the Society, as such, have nothing to do; yet, having heard so much on the subject, I resolved to make some enquiry about it, when lately at Halifax on business. I conversed with most of the principal gentlemen of that place, as well as with those of middling rank, on that point; and I can testify that they were unanimously inclined to encourage our own farmers, and to purchase their meat, when sold at a reasonable price, in preference to any that is imported. Many had purchased little or no imported meat for a twelve-month past. This branch of trade with the Americans is much on the decline; and if my brother farmers will only exert themselves to supply the Halifax market, and be content with a moderate profit, I can assure them they have nothing to fear from this traffic—it will drop of itself; especially if the laudable plan lately formed by the farmers of King's county be adopted throughout the province.

My situation enables me to know the sentiments of people in the country, better than you probably can, who reside in town; this induced me to state the above matters, which, I conceived, would not be disagreeable to the Society, and may be of some use in other respects. At the same time, I have the pleasure to tell you, that for *one* man who hints at any trifling objections of this sort, there are *fifty* who highly approve of your Society and its proceedings; and express the warmest gratitude to the gentlemen who thus generously exert themselves for our common welfare. You have the hearty thanks, and will, I trust, have the concurrence and assistance of all that possess any share of public spirit, disinterestedness, or information. They are peculiarly pleased to see his Excellency the Governor, and other respectable characters, at the head of this institution; and from thence they derive flattering expectations of its success. In these expectations they are the more confirmed, by considering that your Society has been formed at the properest time—the very time when it was most wanted, and could be truly serviceable. A moment's reflection on the former and present state of this province, and its relation to other parts of America, will fully evince this point.

Formerly, the inhabitants of Nova-Scotia were few in number, and fishing was the principal business carried on. The old colonies were then a part of the British dominions;

the inhabitants were our fellow-subjects; and they exported, without any restriction, bread and every other article of provision to this province, which were thereby procured cheaper than they could at that time be raised here. The scene is now totally changed. Those colonies are severed from Great-Britain, their inhabitants are become foreigners to us, and their trade with us is unavoidably under various restrictions. The number of our people, by natural increase, and a large influx of industrious emigrants, is more than double since the commencement of the late war. This increase of people at once enables us to turn our attention to other branches of business and commerce besides fishing, creates a proportionable demand for bread and other provisions, and affords the means of raising them. Bread cannot now be procured at the same moderate price as formerly from the American States, who having connections with other foreign states, the casual demands for their grain, will frequently raise the price very high. Besides all this, the importation of bread and other articles from them, will check our own industry, will drain away our cash, and always keep us poor and dependent on them.

These matters are evident to any man of common sense, and common information. They shew clearly the necessity of our exertions in the line of husbandry; for we must now depend on our own labour and produce for bread, and every kind of food. They evince how well-timed the institution of your Society was; since it will give a spring to industry, and assist the farmer in the various branches of his business. Hereby provisions of all kinds will become cheap and plenty, without which it will be impossible to prosecute our fisheries, or any other species of commerce, to advantage. Indeed, if any among us wish to keep this country poor, and to enrich the American States at our expence, they act very consistently in opposing this and every other measure that would promote industry among us; but on any other principle, their conduct would be absurd and irrational.

For my part, I have no interest to serve but what is common to every individual in the province. I ardently wish for its prosperity; and am confident that nothing is wanting to make it happy and flourishing, but oeconomy and well-directed industry in the inhabitants. We are blest with a fertile soil for grain and grass, and with a most healthy climate; we abound in good harbours, in extensive fisheries, in excellent lumber for ship-building and other uses, and in a variety of rich, productive mines. With these advantages, and fostered by the Parent State as we are, it must be our own fault if we are not wealthy and prosperous; but to improve them

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right for this purpose, bread and other provisions must be cheap, and those supplied from our own internal resources; this last can only be effected by judicious husbandry on an extensive scale, to promote which is the object and design of your Society.

I have the honour to be, Sir,  
The Society's and your  
Very humble Servant,

March 5, 1790.

COLUMELLA.

To the SECRETARY of the AGRICULTURAL SOCIETY, at  
HALIFAX.

SIR,

I OBSERVED in the Halifax Journal, of the 11th February, taken from the Quebec Gazette, observations on that most dangerous disease in wheat, called the smut; and as I cannot agree with the author of that piece respecting the cause of that disease, I have taken the liberty not so much to ascertain the cause, as to point out the remedy for that pernicious malady.

The author justly observes, that there are two sorts of smut; one he calls rusty smut, which is the worst; the other dusty smut; the last is common amongst barley, oats and rye, as well as wheat; but it does no material injury to the crop: I suppose it proceeds from some defect in the seed. As to the rusty smut, it is a very pernicious disease and very prevalent in Nova-Scotia: the grains that remain whole after threshing, a very few, will cast a deep shade on a considerable quantity of good flour, and render it disagreeable in smell and taste. The only way to prevent their bad effect is, to wash the wheat in clean water, skim off all the smut and other foulness, and then dry it in the sun or in a kiln; after which it will make as good flour as any other clean wheat. I cannot pretend to investigate the cause of the rusty smut, but believe it proceeds from a defect in some of the light underlain seed corn, and not from mists, or the various intemperatures of the air, or kinds of land it is sown on, or contagion from the dirt of smut adhering to the seed or manures, as the aforementioned author observes. I have constantly followed the business of farming in Nova-Scotia twenty-eight years, and generally sowed from 20 to 30 bushels of wheat annually, and have experienced on all sorts of land in the part of the province where I reside, and never observed one smutty grain of wheat in my fields; but my neighbours are seldom free from it, more or less. I have endeavoured to inculcate the means to prevent the smut amongst them; some few have adopted the

the means with good effect; others, the greatest number, partially, or not at all; so that very little wheat is to be had but what is more or less smutty. I agree with that author, that the farmer ought to be very careful to procure good seed; a bright heavy full grain, free from all sorts of mixture, and to change his seed often, (it would be best to do so every year); this change of seed should be procured from a considerable distance, and from a different soil. I have often had pease, barley, oats, and other spring grain from England, and always found a rapid growth and great increase, the first year especially. I have been obliged to sow wheat that was smutty (not of my own raising) when no other could be had, and the seed I had reserved would not hold out for the land—I had prepared, and have had good crops without smut. I have often supplied my neighbours with seed wheat, from the same heap I took my own from—theirs have been smutty, and mine not. One instance in particular I will mention: Some years past, a tenant of mine came in the spring and desired me to let him have some seed wheat, the wheat he had, being foul and smutty. I let him have what he wanted, and advised him in what manner to prepare it before he sowed it: he was an elderly man, and answered, he knew very well how to raise wheat before he came into this province. I told him, notwithstanding all his knowledge, if he did not prepare his seed as I advised him, his wheat would most probably be smutty. He took his wheat from the same heap that I sowed mine from; and in the fall, as he did not return the seed, I called on him for it; when he said, he was ashamed to bring it, for his wheat was nearly one half smut, and that he was convinced some preparation was necessary to prevent it; and he was the more convinced of this when he saw my wheat entirely free from smut. These instances prove to me that the cause of the smut in the seed may be destroyed.

The following is the method I practice of preparing seed wheat, to prevent the crop from being smutty:—Take a tub that will hold as much as you intend to steep at once, put in a cap wisp of straw in the same manner you do a leech tub; set it up where you can conveniently draw off the liquor you intend to put into it; fill the leech-tub about half full, with a good pickle: I generally use the pickle my beef, pork, or fish has been cured in: If it is foul or not strong enough, boil it and skim it clean, and add more salt to it; there is no danger of making it too strong. When the pickle is prepared, put in the wheat very slowly out of a half bushel or pail, in the same manner as when it is winnowed, to prevent any quantity of the heavy grain falling in together that might carry down oats, or any light stuff with it, all which I skim off;  
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when the tub is so full that the pickle stands about two inches above the wheat, stir it well about with a stick, and skim off every thing that swims; let it stand twenty-four hours at least; but as the weather is generally cold at seed time; thirty-six or forty-eight hours is better, then draw off the pickle and reserve it for another steeping, let it drain a little, then throw out the wheat on a floor, a smooth earth floor is to be preferred; but as you throw it out a little and little, sift slacked lime on it; about half a bushel will serve for four bushels of wheat; after the wheat is all out and limed, turn it and mix it well, so that some lime may adhere to every grain if possible. If the ground is ready, you may sow it the same day; or, if the weather or other accident prevents, it will take no damage if it lies on the floor a fortnight or more, only it must be turned and not lie too thick, to prevent its heating, which however, it is not so apt to do on an earth floor;—this is the whole process—and whoever will faithfully put it in practice will find the good effects of it. It sometimes happens the farmer cannot procure lime, which has occasionally been my own case, though seldom; in such cases, good wood ashes will serve as a substitute, but, I think, not so efficacious. I am as careful to procure lime for my wheat as salt for my provisions. The farmer says, this process is troublesome, besides the expence of time; such language as this I have often heard: But there are many necessary things to be done in farming, as well as other employments, that are unavoidably troublesome and expensive, which, nevertheless, must be done; besides in this case, the trouble and expence will be amply repaid in the crop.—I am fully persuaded this preparation not only cures or prevents the smut, but gives a strong vegetation to the first sprout of the grain, which serves as a manure and betters the crop. The lime made use of should be slacked by the wind, by long standing in an open cask in an airy place: But if stone lime is used, it should be slacked leisurely by sprinkling hot water on it a little at a time, so that it may be a dry powder before it is sifted on the wheat. Many farmers in England dissolve a pound of green copperas in the pickle before they put in the wheat, and others dissolve stone lime in it, to make it more powerful; but this I never experienced. The smut in wheat used formerly to be as prevalent in England, as elsewhere, if used without preparation, though very few omit it now.

My present purpose being only to correct the error respecting the cause and cure of the smut in the wheat, I shall not at present say any thing on other grain or the cultivation of land, &c. which may be a future consideration.

If the Society for promoting agriculture, think these remarks worth notice, they will make the proper use of them.

I am, Sir, your Humble Servant,

A FARMER.

At a Meeting of the Society for promoting Agriculture in the Province of Nova-Scotia, at Halifax, the 13th of December, 1790.

The President being absent, the Vice-President took the Chair,

IT being the Anniversary Election of Officers for the ensuing year, the following gentlemen were appointed :

Governor Wentworth, President,  
The Reverend Dr. Brown, Vice-President,  
Mr. Hartshorne, Treasurer,  
Mr. Clarke, Secretary.

The Directors the same as last year.

The Secretary will acquaint Governor Wentworth and Dr. Brown with their appointments,  
Adjourned to the 16th instant,

At a Meeting of the Society for promoting Agriculture in the Province of Nova-Scotia, held, by Adjournment, at Halifax, the 16th of December, 1790 ;

Governor Wentworth took the Chair as President for the ensuing year.

THE thanks of the Society were given to Mr. Bulkeley, for his services, as President, the past year.

The Secretary informed the Society, that the Reverend Dr. Brown accepted the appointment of Vice-President.

The Secretary read a letter he had received from the Reverend Dr. Byles, Secretary of the Agricultural Society at St. John's, New-Brunswick, enclosing the Plan of that Society, and requesting a correspondence.

Read two letters under the signature of Egdoli, containing not only many useful remarks upon the advantages resulting from a judicious plan of husbandry, but a number of necessary hints upon the cultivation of wheat. The correspondence of this ingenious writer is solicited, his communications will be thankfully received and particularly attended to.

A manuscript entitled " Observations on the progress of Agriculture in Nova-Scotia and New-Brunswick," was laid before the Society and read. The writer has the warmest thanks of the Society for the many interesting and important remarks contained in this manuscript, it is hoped the time is fast approaching when the two provinces may experience the advantages of the plan which he has suggested ; when that period arrives, his observations will

will be published, but they are too lengthy to be inserted in these proceedings.

The President, Vice-President, the Bishop, Mr. Grant, Dr. Almon, and the Secretary are appointed a Committee, to whom the Secretary will communicate all letters he may receive from time to time, for the purpose of being examined and revised, that the same may be published without loss of time, which committee will report their proceedings to the Society: They are also requested to collect from the most approved writers in England and America, such papers and letters upon agriculture as are best suited to the soil and climate of this country, and the circumstances of the inhabitants, and to have the same printed and published in the proceedings of the Society for the last year, as soon as the nature of the design will admit.

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To the SECRETARY of the AGRICULTURAL SOCIETY, at  
HALIFAX.

SIR,

A NUMBER of the principal inhabitants of this province having lately, under the patronage of his Excellency Lieutenant-Governor Carleton, instituted a Society for the encouragement of Agriculture; they have judged that nothing will have a happier tendency to promote the success of their endeavours, than immediately to open an extensive correspondence with the other Societies which are established, in different parts of America, for the same benevolent purpose. Through this channel; whenever any valuable discovery shall be made, or intelligence obtained, relative to our design; the fact will instantly circulate, and the benefits resulting from it be rapidly diffused through the continent. Flattering ourselves that this proposal of keeping up a mutual intercourse will meet with your approbation, I now enclose the plan of our institution, and beg leave to request your correspondence.

I am, Sir, with due respect,

Your most obedient humble Servant,

M. BYLES, Secretary.

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PLAN of an INSTITUTION for the Encouragement and Improvement of AGRICULTURE in the Province of NEW-BRUNSWICK.

I. EVERY person, becoming a member, to pay one guinea annually into the hands of the Treasurer, for the use and benefit of the Society.

II. That

II. That the affairs of the Society be under the management of a President, Vice-President, Treasurer, Secretary, and Directors, to be chosen from amongst the members, the first Wednesday in June annually, at a general meeting of the Society, in the City of Saint John, five or more of whom (the President or Vice-President being one of the members) shall constitute a quorum.

III. That the President, Vice-President, Treasurer, Secretary and Directors meet in the City of Saint John, the first WEDNESDAYS in March and September.

IV. That the President, and in his absence the Vice-President be authorized to call the meetings of the Directors and other officers, or of the subscribers wherever the business of the Society shall require it.

V. That the Society use every means in their power to obtain information respecting the objects of its institution, and communicate the same to the public at large.

VI. That the Society correspond with other Agricultural Societies.

VII. That all Letters to the Society be addressed to the Secretary.

VIII. That the subscription money be paid into the hands of the Treasurer previous to the annual meeting in June, at which time his accounts shall be laid before the Society for their inspection.

IX. That any member not finding it convenient to attend the annual meeting, may depute any other member to act and vote for him.

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To the SECRETARY of the AGRICULTURAL SOCIETY, at HALIFAX:

SIR,  
**W**ITH infinite satisfaction I saw the institution of your laudable plan announced in the papers: Experience has proved that such Societies have the happiest effect in promoting the science of agriculture, even in England, enlightened upon that subject as that island doubtless is; how much more then may we expect your patriotic design will have the best consequences in this new country? The various descriptions of men which the fate of war and other circumstances have thrown into the province of late years, is well known to us all, and of these people how few have had former opportunities of gaining experience in matters of husbandry; and yet many are under the necessity of depending upon that employment for support: In such circumstances, the utility of your institution

institution shines with peculiar lustre. To diffuse useful knowledge in a branch of science understood by few, though necessary to be practised by all, must speak its own eulogy.

If the occasional observations of one situated in an obscure corner of the province, who, to some practical knowledge in England, joins the experience of many years residence in a new part of this country can be acceptable, or may be thought to further the design of your institution in any degree, I will, if you encourage the idea, from time to time take the liberty of troubling you with such remarks as shall occur to me, and which may be useful.

Agriculture is a science, for the study of which, the life of man is much too short;—hence arises the necessity of recording discoveries for the benefit of our contemporaries and posterity. The generality of practitioners have not access to the press; or, if they had, have too much diffidence to venture that method to promulgate their experience. Your Society opens a door to such, as through their means the province at large may become acquainted with the experiments made by individuals in every quarter. It becomes their care to select from the various information which may be sent you, such only as contain good and useful knowledge; in doing this; all the experience is necessary which, no doubt, the members of the Society collectively possess: but give me leave to say, it seems to me the publishing this information in the papers only, is leaving the matter short; in the more distant parts these papers do not appear regularly; they are detached and fugitive; a subject is frequently begun in one paper and finished in the following. I submit to your better knowledge, if the communications which you may deem proper to lay before the public (besides the present method of publishing in the news-papers) might not be collected quarterly, or half-yearly, in a pamphlet, printed at the expence of the Society, and sold by the printer for no more than prime cost, to reimburse said expence; was this practised, no doubt, every farmer in the province would gladly become regular purchasers, and it would soon appear what number it was necessary to print.

In our climate it would be often dangerous to adopt implicitly those processes we see recommended by authors much esteemed at home; it is first necessary that we should, by careful and repeated experiments of our own, naturalize and confirm them here. Local agricultural knowledge can be no other way obtained than by repeated experiments and careful observation. I therefore hope my brother farmers will so far second your endeavours as to be very exact and careful in making their experiments: I recommend to them a frequent use of

the pen ; many good and useful hints, which occasionally arise in the mind, but which cannot on various accounts be immediately tried, are lost for want of memorandums : And sometimes when the experiment is begun, and when the result cannot be known 'till a distant season, the whole intent is perhaps at a critical time overlooked or totally forgot ; a methodical memorandum-book in these cases is highly useful to the experimenter; and may become so to the public.

The best method I have seen practised is to divide the memorandum-book into three equal columns like a news-paper ; in the middle, insert the intention you have in making the experiment ; this may be done at the time the idea strikes your mind, though the season renders it improper to be put in practice at that time. In the left hand column explain the operation and process you pursued during the course of the experiment, minuting this business at the times performed, without trusting to memory ; in the right-hand column record the event. This method I have found clear and useful ; it not only keeps the knowledge acquired fresh in the memory, but it reminds you of repeating the experiment a second and a third time ; for little dependance can be made upon one single trial where so many adventitious misfortunes may frustrate the design. A successful experiment is not always necessary to render it of importance ; often useful information is drawn from miscarriages ; for by them the inexperienced are taught to shun those rocks others have split upon. A well-directed experiment, whether successful or not, will always prove useful to the undertaker.

I have lately seen a letter to the Society, signed a Farmer, upon the utility of Composts. I heartily wish and hope there will be an increase of such intelligent correspondents as he seems to appear : I highly approve his doctrine, and sincerely join him in decrying that most vile practice of putting new dung upon land before it has undergone a thorough putrefaction ; besides the reason urged by the Farmer against this practice, it may be observed dung in that state is full of animalcula which you carry on to your land to be ready to devour your crop the moment it appears above ground. Respecting Composts, I will beg your and his leave, to say a few words. In the present state of this country, those processes which are attended with least expence, will be generally esteemed the most useful. I therefore venture to differ with the Farmer respecting the necessity of either claying the bottom, or erecting a shed over the Compost heap ; the situation I chuse for this purpose is as perfect a level as I can find, shaded from the south and west by trees or buildings. The materials of which I form my compost, viz. earth, dung, weeds in a succulent  
state

state before the seed ripens, sea-weed of any kind, sea sand and shells, lime, &c. \* I endeavour to place in layers, always beginning with dung, and ending with earth. These I repeat till my mixture will settle to a convenient height. Round this heap I form a channel into which I endeavor to bring the drains of the house, yard, stable, hog-stye, &c. and from time to time I cause the contents of this channel to be thrown up with scoops into the top of this mixture; likewise, after rains I cause the water which drains from or through the mixture, to be thrown back upon it (taking first the precaution of letting out the rain water that has run into the channel) this very much expedites the putrefaction by increasing the fermentation. It is necessary to be careful in these mixtures to add nothing which requires an unusual time to rot; such as Fern or what is sometimes called Brackens, Bean-stalks, &c. Such should form dung-heaps by themselves. In six months after the formation of these mixtures, the various articles of which they are composed will be in a proper condition to be turned; in doing this, some judgment is required:—The whole mass must be shifted on to fresh ground. Begin at one end, and with a mattock pick down the heap perpendicular, the same as you would a fresh bank of earth; then with shovels throw the stuff to where you intend your new heap to be, within the easy compass of a man's throw; this you will find will most effectually mix and blend the various contents of the heap in one uniform mass, and will create a fresh fermentation. You are to take up as much of the original soil upon which this heap first stood as you judge the virtue of your dung has penetrated. This will add to the quantity, and save the trouble of claying the bottom. Upon forming the heap the second time I raise the top like the roof of a house, covering it over with earth, the cleansing of ditches, &c. by way of a roof, the purpose of which it fully answers. If your land this manure is intended for, is of a clay soil, then let the earth you add to your mixture be as sandy as you can; but if your soil is sandy, add clay; experience has proved the above method to be good, and therefore it is recommended to his brother farmers by

EGDOLL.

N. B. A third turning this mixture, if time allows, will do good,

September 1, 1790.

To the SECRETARY of the AGRICULTURAL SOCIETY, at HALIFAX.

SIR,

THE following hints upon the cultivation of wheat may perhaps prove useful to some people.

F 2

Smut

\* Perhaps Plaster of Paris might form a good article in these mixtures.

*Smut*—may be in a great measure prevented by *Brine and Lime*.—Steep your seed in salt or sea-water, made strong enough to bear an egg, then drain and sift over it some fresh slacked lime, turning the wheat till it is encrusted with the lime.

*Exchanging the seed*.—Particularly if the precaution has been taken to change the seed, which produced the seed you are to use. The exchange is to be regulated by the soil not distance—light land to stiff—clay to sandy—poor soil to rich.

*Deep ploughing*—if the soil permits: Perhaps smut is more owing to want of nourishment to the ear than any other cause: Therefore, if the roots of wheat have plenty of loose earth to feed on, the more probability of avoiding that distemper, for which reason I strongly recommend as a preventive

*Good Tillage*.—Farmers in Nova-Scotia, and indeed in all parts of America I have seen, are shamefully defective in this part of their business. They get a habit of scratching among the stumps of new land, which they never leave off. Neither have I seen any ploughs which are capable of making good work. Another necessary care is

*Keeping land clean*.—I have seen one part of a field which has been well tilled and kept clean from weeds, perfectly free from smut, and another part of the same field which was very foul, where the crop has been, little but smut; yet the seed and soil the same—one part was ploughed by a good workman, the other a bad.

Good rich land, in good tilth, requires less seed than poor land. Small grained (nay, even shrivelled wheat, if sound) is better for seed than large grain plump wheat. A bushel of the first contains more grains than one of the latter, consequently less seed is required. Wheat sown early, and not too thick, will throw out many stalks from one plant, and such always produces the heaviest ears. Wheat sown late is more liable to be destroyed by worms and birds, when shooting, and in a moist wet season runs most to straw.

Frequent ploughings well performed is a great security for good crops. I have experienced throughout a whole farm that crops in different fields bore in their produce an exact proportion to the number of ploughings and harrowings the soil had received. But it is bad to plough either light or stiff land when wet. Stiff land requires more tillage than light; and so ne soils are so obdurate in dry weather, that it is necessary to reduce them with a heavy roller, and sometimes even a roller set full of short iron teeth; these are implements, however necessary, I believe unknown here. Nevertheless, perhaps the best wheat crops are obtained by only one ploughing from a clover lay, i. e. land that has born red clover for the



the year or two years preceding, provided it is clear from weeds. The roots of this grass act as a manure, and put the soil in a proper condition to receive the wheat seed, and answers the purpose of repeated ploughings, saving both time and labour. Timothy grass is, I believe, of a contrary nature. A New-England farmer informs me they find this grass there very unfavourable to wheat. In ploughing these clover lays both care and skill are required. The sod must be well turned, so that there is no appearance of the grass, which, otherwise, will grow among the corn like a mane. In exchanging seed, it is good policy to chuse it from a poor soil, because the chance is more in your favour, that you sow it in a better.

Wheat should not succeed any crop that has stood to ripen the seed. There are exhausting crops, and there are meliorating crops: the exhausting are, with a few exceptions, such as perfect the seed, as barley, oats, rye, &c. and these are improper forerunners of wheat. The meliorating crops which do not perfect their seed, such as turneps, potatoes, clover, &c. are always esteemed the best preparatives for that grain, more especially when these crops have been dunged; for wheat receives the most advantage from manure when it has been laid upon the land the preceding year, having time to get more intimately incorporated with the soil. The crops which are an exception to this doctrine, are such, as though they do perfect their seed, yet, from the great shade and warmth they cause to the ground while growing, are found by experience to fertilize instead of exhausting it; such in particular is hemp, than which nothing precedes wheat with more advantage. Pease, when sown broad cast, have the like virtue, and such kind of crops. It should seem, according to this maxim, that potatoes, of all the crops we know, are the best for this purpose; they are usually planted with manure, and when set in rows, which they always should be, 2 $\frac{1}{2}$  or 3 feet apart, they will effectually cover and shade the land; they do not perfect their seed, and the very action of taking them out of the ground so stirs it and mixes the manure, that it is equal to two good ploughings; here then is every thing we desire. But the misfortune is, if we let the potatoes stand till they come to full perfection, in most seasons, it is full late in this country to sow wheat; but if you sacrifice something of your potatoe-crop, and take them up about the middle of September, and are quick in your operation, it may do; but I would never sow winter-wheat in this climate after September.

Wheat land, in ploughing, should be thrown up into high lands, perhaps 8 $\frac{1}{2}$  feet, or half a rood, is the most convenient width

width, as then a man can walk in the furrows and, only making one step among the grain, he can reach any weed, &c. to pull it up. Cross water furrows should be struck with the plough in proper places, and then thrown out and opened with a spade, to take off the rain water; watch the first shower and it will appear where it is necessary those drains should be made.

I have said thus much upon the cultivation of wheat with a view of meeting the ideas of the Nova-Scotia farmers, most of whom appear extremely anxious to raise that grain, perhaps, in some instances, in spite of nature; for, in my opinion, our climate, upon the sea-coast, is not very congenial to wheat, which I apprehend, from our fogs and dews, will ever be subject to blights, iron-mould, &c. The farmer, therefore, may probably find other crops not liable to such accidents and pay him much better. Rye seems a much harder grain and has this advantage, that it may be sown with success any time before the frost and snow sets in. I may, perhaps, at another time trouble the Society with my ideas upon what I call the *Farmer's re-manufacturing his crops*. If a man raises wheat it goes to market, is sold, and he has no further advantage from it; but raise a commodity wherewith you can fatten cattle, sheep, swine, &c. and your gains will be much augmented, besides the advantage of raising a great quantity of manure. The sea-coast of this province is intended by nature for grazing farms, and perhaps the globe does not contain a country that surpasses it for that purpose. But I have every reason to believe that the fertile soil of Windsor, Horton, Cornwallis, and the long ridge of lands reaching, from Blomedon to the gut of Annapolis, and the vicinity of that part of the province, will, if the industry and economy of the inhabitants continues to increase, in the same proportion as it has done, for a few years past, be fully sufficient to raise not only all the bread-corn necessary for our own consumption and supplying the fisheries, but for exportation. Perhaps no country is so peculiarly blessed as this province, from its being so proportionably adapted to the raising of grain and the fattening of cattle, sheep, swine, &c. The soil is in fact providentially divided for that purpose, to the reciprocal benefit of the inhabitants.

I do not apologise for either coarseness of style or literary imperfections; when the mind is engaged with dung-hills and ploughshares, such may be forgiven.

EGDOLI.

P. S. A crop of wheat which has some smut among it may be much relieved by examining the ears when shot up into spindle; those which are infected appear black and blighted, and

and as they grow towards ripe, the stalks near the ear, will be bent backwards and forwards; those ears should be cut off and taken away in a basket; if not so removed, they will in time burst their skins and infect the sound corn in blossom.

Farmers who keep sheep, may provide a stock of ewe-food against their lambing-time (which should not be till May), by sowing turnep-seed pretty thick upon their potatoe-land, first taken up; those turneps will grow under the snow, and give the ewes a flush of milk at lambing-time, when most wanted.

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At a meeting of the Society for promoting Agriculture in the Province of Nova-Scotia, March 8, 1791.

Governor Wentworth in the chair.

**T**HE Secretary laid before the Society a letter from the Society for promoting Agriculture and Rural Economy in Windsor, with a copy of their constitution and temporary regulations, which were severally read and approved. The Secretary will acknowledge their communications, and urge a perseverance in the very useful and laudable system they have adopted.

The Bishop proposed the Honorable Thomas Andrew Strange, Chief Justice of the Province, for a member, who was unanimously admitted and appointed a Director. The Secretary will acquaint him with these proceedings.

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The following are the Communications received from the Society of the County of Hants.

To the SECRETARY of the AGRICULTURAL SOCIETY, at HALIFAX,

SIR,

**B**y desire of the Society established in this county for the improvement of Agriculture and Rural Economy, I have the honour to enclose you copies of our constitution and temporary regulations. One regular meeting has been held, since the adoption of the constitution; the second was unavoidably postponed, owing to the absence of most of the members; and is to take place on the third Saturday of the present month.

I am directed to inform you of the subjects which have been proposed for experiment to the members of this Society. One experiment has been made on flax, which proves, that, exclusive of the value of the seed, that, which has stood for ripening

pening the seed, produces a larger quantity of flax, nearly as fine as that, which was pulled green. Several experiments were allotted on the subject of raising turneps, as to the time of sowing seed and the best manures for them, &c. but the crops being destroyed by grasshoppers, nothing resulted. Different quantities of lime, marsh mud and plaister of Paris, are to be tried as manures on several crops in the ensuing spring.

Having observed in the minutes of the Quebec Society, the communication of a discovery by a Mr. Bakus, of machines for threshing wheat and cleaning hemp, this Society are of opinion that the introduction of these machines will be highly beneficial to this country, if they produce the effects they promise, and beg leave strongly to recommend to the provincial Society to procure models of them, if they are found to answer the purposes intended. The wheat machine would be most immediately necessary.

We are in expectation of several communications at our next meeting, which we shall transmit to you, if they appear deserving of attention.

I have the honour to be, with great respect,

Your obedient servant,

JOHN VAN NORDEN, Sec'y.

Windsor, 8th February, 1791.

*Constitution of a Society, formed in the County of Hants, Nova-Scotia, for the improvement of Agriculture and Rural Economy.*

I. THE Society shall consist of a President, a senior and junior Vice-Presidents, a Secretary and Members—and shall meet on the first Saturday in July, the first Saturday in October, the first Saturday in January, and the first Saturday in April annually; and as often besides by adjournment, as they shall think fit.

II. On the first Saturday in July, annually, the Society shall chuse by ballot, their President, Vice-Presidents, and Secretary; and at every meeting, the President, or in his absence, one of the Vice-Presidents according to seniority, shall be chairman, and shall be treated by every member with the utmost deference and respect; and shall have absolute power to decide all matters of controversy, that may arise between any of the members. And in case of the absence of the President and both Vice-Presidents, the members present shall, from among themselves, chuse a chairman for the time being.

III. Every member shall consider himself bound to attend at every stated meeting, unless prevented by actual sickness, or absence from the county, or by some other reason, afterwards to be approved by the majority of the Society.

IV.

IV. No person shall be admitted a member of this Society, who is not a resident in the county at least six months every year, or a proprietor of lands in the same. And after the adoption of this constitution, all admission shall be by ballot: And no person shall be ballotted for, unless he has been proposed by a member, at the preceding quarterly meeting of the Society, nor be deemed duly elected, unless it shall appear that two thirds at least of the members present shall have voted in his favour.

V. Every person admitted into this Society shall pay into the hands of the Secretary, for the use of the Society, the sum of five shillings, on subscribing to the constitution, and afterwards the sum of one shilling and three-pence, at each succeeding quarterly meeting of the Society.

VI. Every member that shall, for three months, neglect to pay the sums beforementioned, or any fines which shall be imposed by the Society, shall be applied to in writing by the Secretary, and if he does not, on such application, discharge the same, before the next quarterly meeting, the Secretary shall make report thereof to the Society, when the name of such defaulter shall be erased, and shall not be restored, until he shall have paid all arrears, and be re-admitted by ballot as before.

VII. A standing committee shall be appointed annually, viz. on the first Saturday in July, to consist of the President, the two Vice-Presidents, the Secretary and four members, to be chosen by ballot, which committee shall meet on the Saturday, previous to the ordinary meeting of the Society, and as often by adjournment as they may think fit, to arrange and prepare the business for the subsequent meeting of the Society.

VIII. Such experiments as the Society shall think fit to be made, shall be allotted at their discretion to particular members, who shall consider themselves indispensably bound to make the same, in the manner directed by the Society; and to make report thereon to the Secretary at such period as the Society shall direct.

IX. It shall not be required of any member to make more than one complete experiment in each year; but any member may without previous directions, lay before the Society any number he may chuse, and may propose such experiments and improvements as he may think fit, to be taken into consideration by the Society.

X. The Society shall keep up a correspondence with the General Society formed at Halifax, for promoting Agriculture, and will co-operate as far as possible in carrying their purposes into effect.

XI. A book shall be kept by the Secretary, in which he shall enter the transactions of the Society:—And another in which shall be recorded all donations made to the Society, with the names of the donors—And all donations contained therein, this constitution, and the regulations in force for the time being, shall be read over by the Secretary the first Saturday in July annually.

*Method of preparing Seed Wheat to prevent Smut: By Mr. Arnold Shaw, of Newport.*

**I**N compliance with the request of our Society, I send you an account of the method I have for some time past pursued in preparing my wheat for seed; which is as follows— I take a bushel of my best wheat and pour it slowly into a wide vessel nearly filled with water,\* then stir it and skim off what ever arises to the surface. The wheat being thus cleared of light grains and seeds of weeds, I pour off this water and put on fresh, leaving it to soak for twelve hours, unless in very warm weather, when ten hours will answer. After this I put the wheat into a pickle as strong as it can be made with salt dissolved in cold water; † in this situation I leave it twelve hours.—It is to be observed, that in the above relation, I am supposed to possess but one vessel, should I have more, more bushels of wheat would be under the operation at the same time. The wheat having stood in pickle for twelve hours as above, I then put it in baskets to drain for a few minutes, after this I spread it about three inches thick on a floor, sifting lime over and stirring it until each grain is coated over with lime; I then shovel it into a heap, in which situation I leave it for twenty-four hours at least. It is now sufficiently prepared for sowing. Should any thing prevent its being sown for two days, I again spread and expose it to the air for about five minutes, heaping it immediately afterwards, as before; this I repeat every day until it is sown.

I have pursued this mode for eight years with the greatest success, previous to which my crops were as subject to smut as any of my neighbours. At the first time, not having any great faith in the method, from the bad success of those who had limed their seed but imperfectly, I prepared only half of my seed in this manner, the other half I sowed without any preparation;

\* The Society are of opinion, that it would be an improvement on Mr. Shaw's method, to let the first washing of the seed be with brine, or strong pickle, instead of water, in order the better to float the light grains and seeds of weeds.

† The Society observe, that salt and brine remaining in port, beef, or salt barrels, will answer the purpose of brining wheat, as well as other salt.

preparation; the result was, that the limed seed produced a crop entirely free from smut, the unprepared, on the contrary, one, smutty to a great degree. The year following I intended to have limed all my seed, but at the close of my sowing (wanting some) I sowed a few ridges without previously preparing it, this produced some smut, the other was entirely free from it.—Since this I have always prepared my seed in the abovementioned way, and to such effect, that there has not been the appearance of smut in any of my crops, although it prevails to a great degree in those of my neighbours.

*Experiment to determine whether it is best to plant large or small Cuttings of Potatoes: By the Rev. Mr. Cochran.*

**I**N the Nova-Scotia Magazine \* for December 1789, there appeared some extracts from an Essay on Potatoes, published among the papers of the Bath Agricultural Society, for 1788. In these a prodigious difference is noticed, between the produce from large cuttings and that from small, in favour of large ones, *as nine to one.*

That a considerable difference of produce might escape the observation of mere practical farmers, who seldom make comparative experiments, is readily to be supposed, and that, therefore, it might still be a disputed point amongst them, whether large or small cuttings are most profitable, as the author who relates those experiments asserts it is, and as we know it to be here. But we can hardly suppose that any farmer, who should see one acre in his neighbour's field produce as much as nine in his own, would continue inattentive to the advantage of using larger seed.

In the extracts, where this amazing disproportion of produce is mentioned, it is not stated what proportion the cuttings, used in the one and in the other case, bore to each other. Probably there was a greater difference than between those which are commonly used here. However, if the loss by planting small cuttings should only be one half, or even one fourth part of that mentioned above, still it would be an object highly deserving the attention of farmers. I thought, therefore, it might not be a useless experiment, to try two or three different sizes of cuttings, near to those usually planted in this neighbourhood, and to mark the difference of produce, if any.

For this purpose, in the second week of June last, I took an equal number of cuttings, of three different sizes; the largest (No. 1) were somewhat larger than those usually planted

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planted here. The second size, which I shall call No. 2, was less than one half of No. 1. The third size (No. 3) was about one third of No. 2.\*

I planted 100 hills with each size, four cuttings in each hill. The land, manure, and cultivation as nearly alike as I could make them.

From the first appearance of the plants, a striking difference, in favour of the largest size, was observable. Many of the hills from No. 1, had ten, twelve, or fourteen stalks, strong and healthy. Those from No. 2, much fewer and weaker. Those from No. 3, in many instances had not more than four stalks, and those small and feeble. The difference, though still very perceptible was not so great towards the end of the summer, as at the beginning.

In the beginning of November they were all taken up, and the produce weighed:

No. 1, produced 280 lbs.

No. 2, 249½

No. 3, 168

The medium weight of a bushel, upon several trials, was found to be 61lb.. Therefore the produce of No. 1, was something above four bushels and a half; and the difference between No. 1, and No. 3, nearly two bushels. This is very considerable. If an acre, planted with cuttings such as No. 1, would produce 200 bushels, by planting such as No. 3, the farmer will lose 80 bushels. In four acres the loss will be 320 bushels; in eight acres, which many farmers plant in a season, it will be 640 bushels!

I am informed, that some farmers in the province plant only the eyes of their potatoes, and give the rest to their cattle or hogs. With these the loss must be still greater.

I design to pursue the subject farther, and may hereafter communicate the result to the Society.

*On the Utility of introducing the general Cultivation of Red Clover in this Province: By William Cottnam Tonge, Esq.*

**A**MONGST all the late improvements in the agriculture of Great Britain, which have brought the science so near to perfection in that country, the introduction of red clover may be ranked as one of the principal and most important; the use of this valuable crop, and turneps, has nearly banished

\* The cuttings of each size were weighed, and the weight noted at the time of planting, but the memorandum has been mislaid. However, although I cannot recollect the absolute weight, I am certain the proportion to each other was, very nearly, as above.

banished the practice of employing unprofitable fallows as a preparation for crops of grain. The farmers of Great Britain use clover not only as the herbage for laying their lands down to meadow, but also as a part of their arable system; experience teaching them, that the cultivation of it, is one of the best courses that can be pursued for preparing land for the raising wheat.

The introduction and general use of this crop, would I am convinced, be equally beneficial to this country; to the circumstances of which it appears every way perfectly adapted.

It is a position, which I conceive will be universally assented to, that this province can never become rich or flourishing, until its inhabitants can accomplish the raising of their own bread-corn; and to this great object, the views of all, who wish the prosperity of the country, and particularly those who are employed in cultivating its lands, should invariably be directed.

The causes of the present deficiency are not to be sought in the climate and soil of the country, but may easily be discovered in the injudicious and improper management of the inhabitants. The reason that more wheat is not raised in this province, is, that more land is not prepared for that grain; and it is a fact well known to those who are acquainted with the general practice, that much wheat is sown without any previous preparation of the land; the crops being such as might be expected from such management.

The complaints made against this country, as unfavourable for wheat, are founded in ignorance or prejudice; the crops of that grain in many parts of it palpably contradicting such assertions, as does the judgment of men, who have had experience in agriculture in other countries as well as this. The chief real natural disadvantage that the province labours under, is, the shortness of the season for performing the several works of agriculture; this circumstance may forbid the use of that extensive tillage which is practised under more favourable climates, but does, by no means, extend to prevent every farmer from raising his own bread and a surplus for sale; the aggregate of which surplus will form a fund not only for the supply of those who are not employed in the cultivation of lands, but also for exportation, which I cannot relinquish the hope of seeing take place from this country.

As the shortness of our season may prevent us from availing ourselves of many modes of preparing our lands, which are practised under different climates, we should unquestionably be more attentive to the use of those which are peculiarly adapted to our own; and the cultivation of clover appears to me one of the most important of these, not at present in use.

We

We cannot advantageously cultivate turneps (one of the great ground works of modern husbandry in England) to any considerable extent, because our climate will not allow of our seeding them through the winter, and the labour of getting them up and storing them, would make them too expensive; but no such objection lies to the use of clover, which may without loss of time, or additional expence (except the seed) follow our hoeing crops with the wheat, which usually succeeds them, and would by lying two years in the ground, prepare it in the most perfect manner for another crop of that grain, producing in the mean time most beneficial returns for the land it occupies. By the usual mode of management, wheat is procured but once, after a perfect manuring with potatoes, or other hoed crops (unless by the execrable method of sowing it two seasons successively) it being usually followed by two crops of oats, which divest the soil of all its richness; the land is then turned out to grass, producing little or nothing but weeds until time has restored it to fertility, being unfit for the production of wheat, without another manuring, or lying a great length of time in pasture; whereas, by sowing clover seed with the wheat, following a hoed crop, the land is made to produce two valuable crops of hay and grass, and is rendered in the highest degree fit for the reception of wheat; for let the ground be in any degree rich, on which clover is sown, the deep penetrating roots and long shadowy tops of this plant are sure to increase its richness, and bring it to that mellow state, so favourable to the growth of that grain.

On the whole, I most earnestly recommend to my brother farmers the use of this plant, the cultivation of which will so much increase the quantity of their wheat lands.

The great obstacle to the adoption of it, is the cost of seed (if purchased); and many have been deterred from raising it by the difficulties they have experienced in attempting to get it cleaned from the husk; but the first objection may be obviated by purchasing but a small quantity of the best English seed, for a stock to raise more from; and the difficulty of cleaning seed may be removed by attending to the following circumstance, which is, that in raising clover, to ripen seed, it is necessary to feed down or mow the first growth in the spring (which tends wholly to stalks, leaves and chaff), not letting it grow up till near midsummer; by this means the stalks will be short and thick, will have few leaves on them, and will be covered with large heads well filled with seed, which parts easily from the husk.

A member of this Society (Mr. Burton) who first mentioned this circumstance to me, has raised as fine clover seed in this way as any imported from England, and will doubtless communicate

communicate to any person, desirous of information, the methods he took to clean it.\*

*On raising of Calves: By William Cottnam Tonge, Esq*

**T**HE rearing of stock is among the first objects of the farmers of this country, and a subject well worthy the attention of those, who wish to improve its agriculture and rural economy.

To facilitate this purpose, I beg leave respectfully to recommend to this Society a method I have pursued for three years with a degree of success, which makes me desirous of seeing the practice proposed, generally adopted. My mode is to turn out two calves with a cow, letting them run with her as long as it is necessary for them to suck, when they are weaned as usual in other methods.

The two great objects to be attended to in breeding of stock are, First, the raising of good cattle; and, Secondly, the doing this with the least possible expence. The mode proposed

\* Mr. Burton has since communicated his method of sowing clover seed to the Society, which is as follows:

He sows his seed upon land which he has summer-fallowed the preceding year. He does not desire that it should be very rich, as that would cause the stalks and leaves to grow luxuriant, which would be injurious to the seed. He prefers sowing the clover without any sort of grain, and gives eight pounds of seed to the acre, if the land is rich, otherwise twelve. The first summer he neither mows nor feeds it, but leaves it altogether undisturbed. The ensuing year, when the clover is well up, in the month of May, he feeds it down, by first turning in hares, for about four days; next, neat cattle for the same time, and lastly sheep about half that time. The cattle will not eat the stems, but only the leaves, which would otherwise draw off the strength of the plant, and prevent it from perfecting its seeds so completely as it will by this method.

After feeding down the clover quite close, he removes the dung which the cattle may have dropped; and after this the crop will require no farther care until harvest time, unless any weeds should rise among it, which must be removed.

The seed may be known to be ripe by the appearance of the seeds, or by rubbing out some between the hands. If the seeds are turned dark, the clover is ready to be cut. When it is sufficiently dry he carries it home, and, at a leisure time, threshes it on a good close floor, with common flails. This will separate the heads from the stems. After throwing aside the straw with a fork, as in the case of wheat, he passes the heads through a wide riddle; then threshes them again; which is repeated until the seed be fully disengaged from the husks. It is then cleaned of the chaff by a gentle winnowing, and laid up in bags for use.

In England, they generally separate the seed from the husk in mills properly prepared for that purpose: but Mr. Burton has found the repeated threshing answer as well, and with no great additional trouble. A middling crop may yield about three bushels of seed to the acre; which, at one shilling a pound, will sell, at the lowest computation, for ten pounds. This is a profit which hardly any other application of land, in this province, can equal.

posed tends to both objects; and I trust will be found effectual for their attainment by all who make the experiment.

The best proofs of the efficiency of this method for raising good stock that I can offer, are the cattle of three several growths, raised in this manner, which I may safely say will do credit to the mode of their breeding: But as all who may be inclined to adopt the practice, may not find it convenient to see this evidence of its utility. I beg leave to offer the reasons why I think this method conduces to raise better calves than that usually practised.

In the first place, I believe they get more milk; for the cow being left at her liberty to choose the best pasture in the range, being free from anxiety for her calf (which usually appears to distress those which are kept apart from theirs), and not having the best of her feeding-time taken up in going to and returning from the milking-yard, may naturally be supposed to give much more milk than she would in the ordinary course of management; and the calves, by the constant drain of the milk, may be supposed to increase the quantity; as experience tells us, that the closer a cow is milked the greater quantity of milk she will give; and when farmers wish to dry a cow, they invariably leave some milk in her udder at every milking. In the second place, the calves receive their portion of milk at the times that nature directs them to take it, (and, generally speaking, she will be found the best guide in such matters) and the quantity will be regularly the same daily, a circumstance not to be attained in the usual management, as much must be left to the care of servants or boys. Farther, the calves being accustomed to receive their milk frequently, and in small portions, do not rely on it as their chief food, but become earlier familiarized to feeding on grass, which also makes their weaning more easy.

With regard to the economy of this method, it would not be inconsiderable if confined solely to the saving of the labour of tending and suckling the calves; but this is but a small part of the advantage to be expected. I am as well convinced as I can be by general observation (not having ascertained the facts by experiment) that a much greater quantity of milk is obtained from two cows, by this method of taking the calf entirely from the one, and giving up the other to the maintenance of the two calves, than by the usual method of letting each give half her milk to her own calf; and after the weaning of the calves you have the nursing cow's milk as well as the other's.

Another material advantage to be derived from this mode, is the saving half of the near, and enclosed cow-pasture on a farm, during the fore part of the season, when it is most wanting;

ing; for the cows and calves may be turned into any distant back range or wood pasture, to the very great convenience of most farmers in this country, who generally have an extent of such pasture on their farms. Several objections were opposed to this plan, which all proved trivial in the execution of it. It was suggested, that there would be a difficulty in making the cows take to two calves at once; that they would not take the bull in season; that they would be much reduced in flesh by the suckling, and that the calves would be troublesome to wean: but I found little trouble in making a cow take to two calves. I had only to confine her in a stallion, and put both calves to suck her at the same time, and after a day or two sucking, when the milk had passed through their bodies, she could not distinguish them, one from another, and then I turned them to pasture together. I never had a farrow cow since I pursued the practice, mine always going to the bull as soon as the calves were weaned, which brought them in very good season; they were ever in as good order as those which were milked, and I always found less difficulty in weaning calves raised in this way than in the usual mode, as nothing more was necessary than to separate them at once from the cows, which they forgot in a day or two.

On the whole, I conceive the method worthy of general adoption, and I beg leave earnestly to recommend it to some members, whose situation will allow of it, to ascertain by fair experiment the comparative utility of both methods; which may be done by pairing four cows as equally as possible, turning out calves with one of two, and raising them in the usual way with the other two, carefully measuring the milk produced by each pair in the course of the season, and weighing the calves at the end of it.

*On the Cultivation of Hemp: By William Cottnam Tenge, Esq;*

**T**O expatiate on all the advantages to be derived from the successful cultivation of hemp in this country, would be a task of considerable magnitude; and even to enumerate them would lead me beyond the limits of my present design; I shall therefore only briefly and generally observe, that no crop at present cultivated in this province, yields half such profit from an acre, as hemp; that the extraordinary expence bears no proportion to the amount of the produce; that it affords employment for people in the most leisure season of the year; that so far from exhausting the ground, it tends highly to prepare it for wheat, destroying weeds and meliorating the soil in a supprizing degree; and last-

ly, that it is always in demand, ever produces cash, and from the nature of the demand, must command a good price.— These considerations must be strong inducements for prudent farmers to attempt the cultivation of hemp; and to forward their views, and promote their success, the following directions (partly compiled from the best publications on the subject, and partly resulting from four years experience in that business) are freely offered, with hearty good wishes, that they may answer the purpose they are intended for, and lead to the general cultivation of this valuable crop.

All the authors who treat on the raising of hemp agree, that the soil for it should be deep, rich, light, and moderately dry. Every part of this description points out our sandy dyked marshes, which lie high on the banks of the creeks, and the high rich intervals, as soils perfectly adapted to the growth of this crop; and some trials I have had of the marsh soil, leave me without a doubt, that it is in every respect eligible for the propagation of hemp; and will not fail, with proper management, to produce the most beneficial returns under this crop. Some of our upland soils, answering nearly to the above description, might serve extremely well for this purpose; if deep and dry enough, they may be made lighter and richer by tillage and manure.

The proper soil being chosen, the next consideration is, to prepare it for the seed, and much attention is due to this part of the business. The success of the undertaking depends a good deal on making the ground sufficiently fine; for this purpose, a previous summer fallow is one of the best and most efficacious preparations, and will be found amply to repay its expence, by the goodness of the crop immediately following it, and the advantage it does the land in future. If this mode, however, should be thought too tedious and expensive, the land may be prepared by plowing it once in the fall and twice in the spring. These plowings, I conceive, to be indispensably necessary; but the idea of the cost of them should not discourage the farmer, as they are done with less labour and expence than he may at first imagine; for the land fit for hemp is naturally mellow, and, after the first plowing, is turned with inconceivable ease. With the last plowing, the land should be laid into ridges of about six feet wide (but certainly not wider than eight feet), and then it should be harrowed as fine as the border of a garden; which is easily done in its mellow state.

I conceive the best time for sowing to be, between the 10th and 20th of May, in common years; earlier or later may answer, but I think this period the best. There is a favourable period in every spring, equally free from cold, chilling rains,

rains, and dry parching winds; the showers are then warm, and the air generally in some degree moist; it is the time in which vegetation seems to be exerting all its powers, and is certainly the favourable moment for sowing hemp; as it induces the seed to vegetate altogether; an object of vast importance; for if one half of the crop gets fairly up some days before the other, it infallibly smothers and keeps down the younger growth.

With regard to the quantity of seed for an acre, I have noted the greatest diversity of opinion in the directions I have heard and read on the subject; some directing to sow four bushels, and some only half a bushel; but most say three bushels per acre. Without attempting to set up an opinion contrary to those who have had more experience, I shall only observe, that, in the course of my trials, something less than a bushel and a half per acre produced a crop which appeared quite thick enough for rich land; and two bushels per acre, in the same ground, seemed to produce it as thick as it could stand. It is to be noted, that, contrary to the nature of other crops, the richest land requires the most seed in this. Some writer on this subject recommends that the seed should be kept in a cellar ten days before it is sown. I never practised this mode, but think it an excellent one, as it must tend to produce that equality in the first shoot, which is so important to the success of the crop.

The seed being thus prepared, and the ground made perfectly fine, a harrow should be drawn over it, so as to make little scores in it about three inches apart; this done, the seed should be sown as even as possible. Some recommend the sowing one half length way of the land, and the other across; and I think it a good method, if the sower has not a perfect confidence in the regularity of his last. For covering in the seed, if the quantity is small, you may rake across the ridges with hay rakes, which is an effectual and not very tedious method; but a harrow, with small teeth set very close, does as well and is more expeditious. The cattle that draw this harrow should walk in the furrows. When the seed is sown as here directed, the furrows cleared out with a single horse plow, and the cross drains well opened, no further care is necessary, until the time of pulling, (unless some rank weeds should arise, which it shall be necessary to pull up); for the crop will effectually keep down all weeds of an inferior growth.

It will here be necessary to observe, that hemp is naturally divided into two kinds; the male, which only blossoms, and the female which bears the seed. In England, it is universally the practice to pull the male hemp by itself, leaving the female



male three weeks or a month longer, to ripen the seed. On the continent of America, they generally (with but few exceptions) pull it altogether; sowing some exceedingly thin for a supply of seed. The latter must, I suppose, be the practice of this country; as the same causes which induce the Americans to adopt this mode, operate equally in this province, with the additional one, that the first pulling would interfere with our corn harvests. The reasons for preferring this practice are—first, because there is not, perhaps, so much difference in the ripening of the several kinds of hemp in America, where vegetation is so rapid, as in Europe, where its operations are slower; secondly, because the hemp is not wanted for those purposes of making fine cloth, to which the male pulled alone is usually applied in England; and lastly, (the most important consideration) because it is infinitely the least expensive way; for the separate pulling of an acre of male hemp, certainly costs, at least, twice as much as the taking up of the whole crop together; besides the trouble of two rottings, dryings, &c.

The true time for pulling the male hemp singly, is, when the farina (that is, the flour or dust which is formed in the blossom of a plant) is blown off, when the leaves fade and turn yellow, and the stalk begins to grow whitish; but it will be advisable to delay the work about eight or ten days, if the whole crop is to be pulled together. Hemp is pulled up by the roots in the same manner as flax, and should be dried one or two days before it is rotted; the labour of pulling varies with the state of the soil; if this is mellow and light, the work is less; if stiff and hard, it is proportionably greater; at a medium, I suppose about seven or eight men would pull an acre in a day. When a little dried, the hemp should be tied into bundles about a yard round, for taking the water.

In the knowledge of the rotting part of the business, I must confess my deficiency. I found my directions on this head very imperfect, and have not had sufficient experience to be able to make those I am giving so useful as I could wish. I shall therefore give the best instructions I have received, adding such observations as have occurred to me in the course of my own practice. I conceive it may be set down as a certainty, that the softest water is the best for the rotting of hemp: Some recommend running water; but for many reasons I am inclined to think this improper. A shallow pond, with a clean bottom, which can be filled with soft water, and drained out again; would, I conceive, be the most efficacious and convenient for this purpose; and such a one might be made near to a soft water stream, at a very small expence. The hemp must not be laid thicker than three feet at the utmost;

most ; and, I think, if not more than two feet it would be better. It is sufficient barely to cover it with water, and in this state it is to lie until the bark parts freely from the stalk, which it will do in about five days, if the weather is warm and the water soft ; but otherwise it will take a longer time, even to twenty days. It must at this period be carefully attended to, and immediately taken up when it shows this sign of being watered enough. It will be necessary to let it drain twenty-four hours after it is taken from the water, for it is so tender, at first, that much of it would break and be lost ; on this account, also, the bundle must be set up an end, to grow stiff, for a day or two before they are opened to dry. In this stage, some recommend the drying it immediately, and when dry, stacking or housing it ; others direct that it should be grassed six or eight days on a side, in the manner of flax ; and this I conceive to be the most eligible mode. On the whole, I think the best direction that can be given for this part of the management of hemp, to those who are acquainted with the process of cutting flax, is, to pursue the same mode they find most effectual and convenient for that purpose, (making the necessary allowance for the different sizes of the plants), for the quality of both are essentially the same, and the same general principles of management will answer for each.

Having premised this, I shall mention a circumstance which seems to lead to the discovery of an easier and more expeditious mode of managing this part of the business. I had this year, on a small patch of ground, some very fine hemp which stood for seed ; after drying it a little on the ground when pulled, and taking out part of the seed, I had it set up against some fences to dry it completely for getting out the remainder :—here it stood, until the early winter we had this season froze a great part of it to the ground. About the middle of February, observing that it appeared perfectly well rotted, I cut up some bundles of it, and had the satisfaction to find that it broke better and parted more freely from the stalk, than any I had ever tried before ; and that the hemp was of the first quality for strength and colour. Should some future trials produce the same effect that this accident did, nothing more will be necessary after pulling the hemp, than to tie it in small bundles and set it against fences, until it is sufficiently rotted, which method will save the most troublesome and expensive process in the whole management out of the house.

The dressing of the hemp is performed with mills in those countries where the propagation of it is extensive ; and no doubt they will be constructed here when it is generally cultivated in this province. In the mean time, the work is to be performed with hand brakes, similar to those used for flax ; only

only that for hemp, two should be used, one large for the first braking, and the other smaller to finish the dressing instead of swingling: The large brake should be very strong, and should have but three teeth below and two above; the second should have five teeth below, and four above; and should be as close set as a fine flax brake: Three handfuls from the large brake will make one for the small, and when cleaned, may be folded double with a twist in the middle for packing into a bundle. Of such hemp as I had, rotted in the imperfect manner mine was, common labourers, unused to the business, could dress from one sixth to one fourth of a hundred weight in a day; but I am convinced that were the hemp well rotted, and the people more expert, double the quantity might be done.

A sufficiency of hemp-seed for the use of a farm may be raised on the banks of drains, round barns, in the corners of fences, and other waste places; but if land is sown for the purpose, the seed should be scattered very thin, not thicker than from a peck to half a bushel per acre, and the male hemp should be pulled out in due season; by this means the plants will be large, branchy, and covered with full fine seed. Attention must be paid to the ripening of the seed, for much of it will be found ripe on inspection, while the head appears green. The hemp should be pulled lightly, and as much of the seed as will then part from it, threshed out; it must be alternately threshed and dried, until all the seed is out, which is then to be winnowed and cleaned up. The seed is to be kept in a dry place, and care taken to preserve it from vermin, which are remarkably fond of it.

Having gone through the directions on the management of hemp, I shall generally mention the course of trials which I had. The first year 1787, I sowed twelve bushels of English seed, which never grew at all; this should make people cautious how they trust to seed imported from Europe, which should always be tried in mould before it is used. The same year I sowed a little seed procured from plants which had grown here, and which produced very well. In 1788, I sowed eight acres which had been perfectly prepared for the purpose with fresh seed got in the Jerseys, which cost twenty-five shillings per bushel. The crop came up equally, and looked beautifully; and in the opinion of many who saw it, promised an abundant produce; but a violent torrent of rain, and a long continuance of wet which came in the latter end of June or beginning of July, destroyed these flattering appearances, and almost totally ruined the crop. The water lay several days on the hemp, and was succeeded by a very hot sun, which scalding the ground, destroyed almost every thing on it; some patches which lay higher, escaped, and shewed what might have

have been expected from the whole. One piece which I measured, produced at the rate of 14½ Cwt. per acre, and this produce was obtained from the same spot, where the hemp seed had been raised the year before. In 1789 I sowed near four acres, and had at first as promising an appearance of a crop as I could wish for; but my expectations were defeated by an uncommon accident as that of the year before. A most violent hail-storm came in the latter end of June, and amongst a variety of damage in the neighbourhood, cut down my hemp, nearly as close as if it had been swept off with a scythe. Some of the undergrowth afterwards sprung up, and produced me some hemp and a quantity of seed. I relate these disasters to account for my not having hail more to dispose of, and that those who engage in the business may be aware of them, though they need not be discouraged on this account; as such accidents may not happen again in a century. The first storm was so violent, and the flood so great, that several of the streets in Halifax were cut to pieces, and many gardens absolutely washed away; and the hail-storm was so uncommonly severe in the course it took, that fifty squares of glass in my father's house were broken by it; although for twenty-six years before it had never lost a pane by a like accident. The expectation of a removal and several other causes prevented my attempting the culture of hemp on any large scale this year; but a small spot I sowed did uncommonly well, producing it nine feet high, and still fine enough.

I shall conclude with the mention of a circumstance of importance, which is, that for three years successively I sowed hemp on the same ground, and allowing for the damage done by the hail, the last crop was the best. This year I had wheat on the same ground which did not produce less than at the rate of 25 bushels per acre, with only one ploughing in the spring; a certain proof that the hemp had not impoverished the soil.

I subjoin an estimate of the produce and expences of an acre of land cultivated with hemp, to give some idea of the profits of this branch of husbandry.

Produce—10 Cwt. at 35s. per Cwt.	—	—	£. 17 10 0
<i>Expences.</i>			
1st plowing 7/6—2d and 3d ditto 3s	—	—	£. 0 15 6
Three harrowings	—	—	0 0 0
Two bushels of seed, at 7s	—	—	1 4 0
Sowing, covering seed, and water-furrowing	—	—	0 5 0
Pulling, eight days work, at 2/6	—	—	1 0 0
Drying and bundling, two days	—	—	0 5 0
Watering, grassing, drying and housing	—	—	1 0 0
Carting to and from the water, say one mile	—	—	0 10 0
Dressing 10 cwt. 5 days work per cwt. 2s a day	—	—	0 0 0
Rent of land	—	—	1 0 0

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Total Expences £. 11 5 6

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Clear profit per acre £. 6 4 0

In this calculation abundance of labour is allowed, and large prices for that labour, particularly for the dressing, which is the heaviest expence. In the winter season labourers might be paid and fed for half the wages allowed, and would, I think, soon do more work. Yet after deducting all expences, and rent of land, here is a clear profit exceeding the whole produce of an acre of the best wheat. Surely this must be an inducement for making trials of this crop.

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At a meeting of the Agricultural Society, March 24, according to adjournment,

Governor Wentworth in the chair.

**T**HE Secretary acquainted the Society that the Chief Justice accepted the appointment of Director, and would have attended this evening if his health had permitted.

The Committee appointed to publish the papers and proceedings of the Society, reported their proceedings, which were approved.

The Society resolved to give the following Premiums.

1. A Silver Medal to the person who from April 1, 1791, to June 1, 1792, shall clear the largest quantity of wood-land in this province, so as to prepare it for tillage, viz. to sow wheat or plant potatoes.

2. A Silver Medal to the person who, within the above space of time, shall clear and drain, if necessary, the largest quantity of swamp or interval land, and prepare it for meadow and raising grass.

The quantity of land, in either case, that shall entitle a person to the medal is not to be less than ten acres. The claimants must produce to the Society a certificate of the respective quantities of land that are cleared, signed by the Deputy-Surveyor of the district, and by the Magistrates of the County Court where the land lies.

Medals for clearing the same quantities of land as above specified, and in like manner, will be continued from April 1, 1792, to June 1, 1793.

3. A Silver Medal to the person who may produce the best paper on the nature of the seasons in this province—The defects in the present system of Rural Economy, and the improvements of which it is capable: As the Society is chiefly solicitous to excite and reward a spirit of sound observation in adjudging this premium, they will be determined more by the value of the matter than the correctness or merit of the composition.

*Procefs*

*Process for the manufacturing Salts for making Pot and Pearl Ash: By Mr. Blanchard, of Truro.*

**T**HE ashes, in the first instance, must be pure, preserved from dirt, and kept in some place that is dry and free from the ground; otherwise they will imbibe the nitrous salts, which are very destructive. Take two common leeches, that will hold four bushels each, made of pine and tight, and put a quantity of straw at the bottom—fill one of them with ashes, and put into it about six buckets of soft water—let it stand about twelve hours—at which time add as much water as the ashes will take—then draw off the strong lees, which, if the ashes are good, will be about sixteen buckets. The lees should stand in a tub about twelve hours, first sprinkling on about a pint of lime, which will gradually clarify and make them of a bright amber colour; then draw off the lees (in a pot or kettle, that will hold 8 or 10 gallons), till the water is evaporated, and the salts dried, which will take about one day; in this state the salts must be cooled and put into a dry cask, as free from air as possible. The remaining weak lees of the first must be drawn off and put on the second leech, filled in the same manner as the first, by which means all the salts are saved, and only the strong lees boiled. Four bushels of common ashes, produced from beach, birch, &c. forty pounds weight of salts, which are worth six shillings and four pence. Eight or (not exceeding) nine bushels of ashes from ash, elm, maple and alder, that grow in low lands, will produce one hundred weight. Those salts are worth to the manufacturer of pot or pearl ash, eighteen shillings per hundred weight. As the making the salts belongs wholly to the prudent house-keeper, every bushel of good ashes is worth one shilling and nine pence, with the small trouble of boiling.

Should this province in general think that industry is worth their attention, I am confident it is capable of exporting at least as much of those ashes, as would pay the one half of their imports: And the whole reason why so many have failed in the process, is owing to the impurity of the ashes from having a large quantity of earth mixed with them, which totally destroys their usefulness.

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*A new Method of cultivating and preparing Hemp: By the Abbt Bralle. Printed in England, by Order of the Lords of the Committee of Council for Trade and Foreign Plantations.*

**I**T is sufficiently known, that land intended for a crop of hemp must be well manured, well ploughed, cleaned, and gotten fine; and the season being arrived; which varies much

much according to the soil, weather, and conveniency of the cultivator, extending from the 25th March to the 15th June; sow the hemp seed, which ought always to be new seed, thin, not exceeding two bushels to an acre, and if you have the advantage of a drill plough, still less will do. After the land is sown, go through the whole with a shovel, and with it make little paths at seven feet distance from each other, the length-way of your piece, so that at the proper season you may reach the female hemp, which you will have occasion to pull out, without trampling on the male, which must stand at least a month longer to ripen its seed. The female hemp, (which is that which bears only flowers and no seed) is known to be ripe by the flowers fading, the farina succundans falling, and *some* of the stems turning yellow. You must then draw out carefully the whole of the female hemp, breaking as little as possible the stems of that which you take, or that which you leave.

Immediately as it is gathered, take it in as large handfuls as you can, and either cutting the roots off, or leaving them on, as you like best (I prefer cutting them off) hold the root end uppermost, and with a wooden sword dress off the flower and leaves, which you leave in the field, since they assist in maturing; pick out any weeds or spoilt plants; put twelve handfuls or gripes together to make a bundle; then lay the bundles in water; it is much the best to be a running and clear water, and if shaded and overhung with trees the better; lay poles or planks, or whatever else you have that is suitable, across a large number together, so as to keep them at least two inches under water. Take particular notice which you lay in first, and how you lay the bundles, in order that you may be able to get them out again successively as they were laid in, without breaking or tangling. At the end of six days visit the hemp, and see whether the reed will draw out from some of the bundles. The time required for soaking depends very much on the nature of the hemp, the weather, and of the water it is soaked in—from six days to nine, or even eleven. It is a trouble that is not ill bestowed to sort the hemp for soaking, if it is of unequal sizes, the slenderest generally requiring most soaking.

When you find any quantity sufficiently soaked, take it with care, putting the hands under it to prevent breakage, and transport it to a *trough* or to a *table*; for there are two methods of working it. If you work it in a trough, you must be provided with one somewhat longer than any hemp that you mean to work in it—twelve or fourteen inches deep, and of what width you think proper, according to the number of persons you employ at it, as one, two, or four. To this trough must be fitted two pieces of plank, of about a foot length, but of such width as to stretch over a bundle of the hemp as it lies

*opened*

*opened* in the water: these planks must be set on one side with teeth of brass wire, and when the hemp is ready for drawing, must be laid on it as it lies in the water, to keep it strait and immersed.

If you work the hemp on a table, you must, before taking it out of the water, open a little the bundles, and rub the stems between your hands to get off what you can of the slime, and to loosen the rind. You must likewise push the bundle along in the water, with the loose end foremost, to loosen the rind at that end where the operation is to be begun. If you do not thus rub and scour your hemp in the water where you soak it you must do it in the trough. But in either case you must be careful to keep an even and steady hand to avoid breaking the reed, which, as many times as it happens, renders the operation of getting the reeds out tedious. If it is wrought on a table, the bundle must be frequently though slightly wetted. If any suitable method could be taken to make water drip gently on it, it would be best. A plank must be laid on the bundle to keep it steady.

All matters being properly disposed, either on the table or in the trough, you must begin at the root end to push back a little of the rind from the stem; then taking hold of one stem at a time, and rather near the outside than middle of the bundle, keep your hand and the reed under water (if you work in a trough) and draw it out from the bundle as strait as possible, you will find it come out as clean as a sword from its scabbard. As you proceed you may take two, afterwards four, and up to six or more reeds at a time, which will draw out still more easily. When you have drawn out all the reeds that you can find at the root end, lift up the spiked plank which was at the upper end, leaving on that which was in the middle, and draw out such *pieces* of reed as you may find at the upper end, and which have remained after drawing out what you could at the root end, because they were broken. Lastly, take off the plank which lay on the middle, and take out all the relics of reed you can perceive. If your hemp was in good condition for drawing, you will find all your reeds perfectly clean on the floor, and the rind, which is the hemp, lying in strait threads, in the water or on the table.

You will perceive that among the hemp there is a great quantity of gum left looking like a jelly; this you will wash out as if you were washing any long strait piece of cloth, observing not to displace or twist the threads, which would thwart the future operation of dressing or heckling. The finer and whiter you desire the hemp to be, the more water you will run it through, squeezing it out at each time of washing; but I think it *always* right at the last to run it through a



water in which a small quantity of soft soap has been beat up, after the rate of an ounce of soft soap to three pounds of the hemp when dry. Do not squeeze it out from this soap water, but hang it to drain, and when a little stiffened, open a little the bundle, and lay it to dry on a grass-plot or floor; the former is preferable. This soap water is not absolutely necessary, but is certainly of great use for softening the hemp, and rendering it pleasant and easy to dress; but may be dispensed with where it is very inconvenient, and where the hemp is intended for coarse purposes. It is obvious that all these operations would be carried on to the most advantage near to some running stream or large lake, if it be a standing water, on account of the great use that is made of that element, and to save a great deal of the trouble of transportation.

When thus dried, the hemp is proper either for dressing or storing; if the latter, particular care must be taken that it be thoroughly dry, it will otherwise heat and spoil. As the hemp peculiarly intended to be hitherto spoken of is the female, or flower-bearing hemp, which is intended for fine uses, it is to be observed that it must be worked with heckles or hatchels, such as are used for *flax* dressing, and may be brought to an extreme fineness; and the shorts, having no pieces of straw or reed among them, may be carded and spun, and brought into use for all the same purposes as cotton, and the same methods used for bleaching and softening. It is likewise requisite to work this hemp as soon as pulled, without which the greatest softness and whiteness cannot be obtained; and as this sort generally falls ripe between hay time and harvest, when the weather is warm and fine, and the women most at liberty, it will be a suitable occasion to draw and cleanse the hemp—the dressing may be reserved for winter.)

I now proceed to speak of the male hemp, which being a more considerable crop, cannot all be worked as fast as it is pulled or cut. It is known to be ripe enough by the stems becoming pale; for if you stay till the tuft containing the seed appears ripe, or the stem turns brown, the hemp will be in a great measure spoiled. When it is come to a proper maturity, you must get a good number of hands, so as to expedite the business, because such as remains standing after it is ripe, will have its rind fixed to the reed, the gum turned hard and dark-coloured, and the whole operation of drawing becomes difficult, troublesome and ungrateful. The leaves are to be stripped off with a wooden sword, in the same manner as those of the female hemp, as are likewise the seed, the branches which grow laterally, and even the tuft-bearing seed at the top: But if this latter should not come off clean, it must be chopt off with an iron instrument. All this must be done over a cloth

cloth, or on a spot of ground in the field, well levelled and smoothed, to avoid losing any of the seed. And it is proposed, and said to be successful, to leave the seed abroad, covered with the leaves and chaff strewed on the land. This certainly saves trouble, and is practised in many parts, but seems to me slovenly, and I would rather take it home to a barn; but I would certainly burn all the roots, and such parts as are too hard to rot easily, and strew the ashes as well as the leaves, and such other parts as will easily rot, upon the ground, as these matters are reckoned to go half way towards manuring the land for next year's crop. The male hemp, thus stript of leaves and seed, will generally dry for storing in twenty-four hours; but at any rate must not be left long abroad, but rather taken into sheds to dry, which, when thus stript, it will speedily do. Sun and rain would soon spoil it. That which can be wrought green must be treated as before set forth for the female hemp; and it is obvious that it is a great advantage to work it in this manner, rather than to dry and store it, which causes much trouble and expence and produces less and worse hemp; but where the crop is considerable, and the hands few, it is unavoidable.—If, however, much rain comes, it is impracticable to dry it for storing without spoiling, as every year's experience shews in the present received method; whereas the working the hemp green entirely avoids this disadvantage and inconveniency, and the hands engaged may continue their employment under the shelter of trees, or of a temporary shed made of a few rough poles and hurdles, covered with straw, reeds, &c.

All the same procedure is to be used with the male as with the female hemp, as to drawing, scouring, &c. but as the reeds of it are less brittle, and the rind coarser, it requires more soaking, but is easier to draw, and produces much more and stronger hemp. What is stored must, when wanted to be wrought, be soaked, peeled, washed, and in general treated as before said. In cold weather it takes long soaking.

*The calculation of expences and profit of an acre of hemp in this country, (England.)*

	£.	s.	d.
Rent 20s. per acre	1	0	0
Manure the first year more than others, but it is most advantageous to sow after a turnep crop—say 40s.	2	0	0
Three times ploughing and harrowing	0	18	0
Seed two bushels—price unknown, but in France, 5s	0	10	0
	<hr/>		
	4	8	0
	Expences		

	£.	s.	d.
Expences brought over	4	8	0
Pulling the female hemp, and trimming	0	10	6
Cutting male, and trimming for putting in water	0	7	0
Getting from the reed, and washing the female, 7lb. per diem at 9d.—50 bundles containing 125lb.—16od : 5	0	13	6
Getting the male from the reed, and washing 14lb. per diem at 9d.—375lb. 24d.	1	0	1
Soap 10lb. at price in France 3d.	0	2	0
Thrashing seed	0	2	6
<b>Total expence</b>	<b>7</b>	<b>4</b>	<b>1</b>
Female hemp, 124lb. at only 1s. but worth in the rough much more	6	5	0
Seed 16 bushels, at 5s—supposed under-valued	4	0	0
Male hemp 375lb. at 7d.½ lb.	11	14	0
Faggots	1	0	0
<b>Total produce</b>	<b>22</b>	<b>19</b>	<b>0</b>
<b>Total expence</b>	<b>7</b>	<b>4</b>	<b>1</b>
<b>Total profit</b>	<b>15</b>	<b>14</b>	<b>11</b>

Suppose the expences under-rated 20s. per acre, and the gain over-rated 4lb. 15s. there still remains 10l. clear gain; to which is to be added, that the further improvement of the material in dressing and spinning, employs the poor, and particularly women and children, who are a heavy burthen to the farmer in all countries.

*Detached Observations on Hemp.*

IT is capable of being cultivated on all kinds of land; the poorer land producing the hemp finer in quality, though smaller in quantity and the rankett land producing strong and long, though coarse; and this sort being the easiest to draw and work in the new mode, the quantity of manure requisite in the first instance is not above half of that for wheat, and the subsequent years not above half of that half, and the hemp still improving in quality. All the work in the new method, not excepting the dressing, is fitter for women than men, and may be practised advantageously by every cottager.

No bleaching is wanted for the linen made of hemp prepared in the new method; and it is certain, that if the hemp be fine

fine, well managed, and dressed with the finest flax-hackle, it may supersede almost all the uses of flax, which flax is a more uncertain and less abundant crop, requires more culture and better land, which it exhausts; whereas hemp-grounds increase in goodnefs. If the male hemp intended for cords has been treated with little attention, and but little scoured or bleached, the shorts which come from it in dressing may be scoured over again, to render them more useable. The hackle, and even the hemp itself, may be a little oiled in the dressing, which will much facilitate that business, and instead of fouling, will rather assist in bleaching the threads, when they come to be washed.

Both the dressing and spinning of hemp are best carried on in a damp place. Hemp is naturally inclined to twist too much in spinning.

The greatest injury that can befall hemp is that of sun-baking. But after all, the greatest injuries that can be done to hemp, the new operation may be performed on it; though with little success, yet sufficient to render it better than that which is procured by any other operation, whereof I have, at this moment, the proof under my eye. The greatest whiteness can never be procured but by working it green. If stored, the greener it is got in, the whiter it will be. The more the colour is changed, the worse will be the colour of the thread.

Fifteen pounds of male hemp may be gotten off in a day by one person; only seven pounds of female. It is necessary to pick the hemp-plants over at several different periods, in order to avoid having any bad stems among the good, which might spoil a whole parcel, especially if intended for fine linen.

There is great reason, from a slight attempt that has been made, to think that a dye might be procured from the water in which the hemp is scoured, after that it is gotten off from the reed.

It is likewise thought that an instrument may be imagined for drawing the reeds from the threads or rind or else the rind or threads from the reed, more expeditiously. A few bundles have been cleaned with a common rake.

In France it is common, at the time of pulling the female hemp, to scatter turnep seeds in among the stems of the male hemp, which are left standing, and these turneps frequently produce a good deal of feed for sheep or cattle after the male hemp is taken off. It is obvious that whatever has this effect, has, besides the benefit of supporting the stock of a farm, that of aiding to mature the hemp-grounds, especially if it be sheep that are fed on it; therefore if this method fails, it would

would be prudent, immediately as the hemp is off the ground to plow it up, and sow turneps, cole-seed, rye, or any other thing proper for sheep-feed, which can be gotten off early in the next spring, so as to be able to till the land well in time for receiving the hemp-seed.

It is less an injury to the hemp to pull the plants before they are ripe enough, than to leave them too long standing. It is a less injury, in soaking the hemp, to leave it too long in the water, than to take it out before it is sufficiently soaked.

The more the hemp is cleaned after getting off the seed, the finer it becomes, and the finer dressing it requires, no thing but experience can mark the degrees.

The time of day and the time to begin the culture of hemp on any land, is the same as for a crop of turneps; exactly the same as if you were to sow it low barley.

The cluster of hemp costs in France only three pence per lb. seed, and the making the suds through which the hemp is spun.

It is asserted from experience, that putting the clusters containing the hemp seeds to sweat and heat, causes many of the seeds to come to perfection, which, in the common method, would wither and become dead; and that it of course improves both the quantity and quality.

*Brief Account of Norfolk Husbandry and Course of Crops: By a Gentleman near Norwich. From the Bath Society Papers, Vol. I.*

GENTLEMEN,

**I**N answer to your enquiries respecting the improvements in husbandry made in this county, be pleased to accept the following account.

About sixty years since, a great part of this county was sheep-walks, rented only at about eighteen-pence an acre; and even within my memory, many thousand acres were in this state, which now are turned into the finest farms, and let at twenty shillings per acre.

The late amazing improvements may be attributed to various causes. Among others the following have not the least operative.

1st. Inclosing our heath and waste lands; folding sheep; and the most extensive use of marle and clay, on sandy soils especially.

2dly. By the general introduction of turneps, well husbanded; of clover, ray-grass, and buck-wheat, and an excellent course of crops.

The

The farms being generally large, and held on long leases, the tenants were thereby enabled to lay out their money freely in improvements, without being in danger of losing the advantages arising from their cost and labour.

We possess one natural advantage, which, perhaps, cannot be found in an equal degree in many other counties.

In all our sandy lands, wherever we dig, we find excellent white and yellow marle or clay. The goodness of the marle is determined by its subsiding quick in water. On the first discovery of marle, our farmers spread it in larger quantities than at present; few laid on less than eighty loads per acre; but for near thirty years past, the general quantity has been from forty to fifty loads (or tons) per acre. The effects of this quantity will last twenty years; and then half as much more added will restore fertility to the soil.

We have however found, that, on lands wholly sandy, clay has had a better effect than marle; but where the soil is a mixture of sand and loam, or of sand and gravel, marle does excellently.

It is not, however, to marle and clay only, that our improvements are owing. Our sheep are folded both summer and winter. We fatten beasts during the winter on turneps in our farm-yards, in which we also keep a large stock of swine. Our stubbles are cut, and, with large quantities of straw converted into manure. Oil cake is also laid on wheat lands to the amount of two guineas per acre. These manures, freely used, have proved the sources of wealth to thousands.

The usual course of crops among our greatest and best farmers, is, 1. turneps; 2. barley; 3. clover, or clover and ray-grass; 4. wheat. This course has of late years become very general, and keeps the soil clean.

We manure for turneps, if possible, and also for wheat. Sometimes our clover is extended to three years, but not frequently. Of late, especially, our clover often fails the third year, and sometimes the second, if the land be wet; for wherever the water stands in the winter or spring, clover turns black and decays.

Our farmers agree in the opinion, that if turneps are sown on a well-conditioned fallow, and twice hoed, and the land ploughed three times for barley, the clover may remain at least two years without giving a foul crop of wheat, especially as our wheats, on clover lays, are of late almost wholly set, and more easily kept clean than when sown broad-cast. We set from two to three pecks per acre, and find great advantage from the practice—the expence of setting by hand is, from six to eight shillings per acre. On our fallows, we plant with Mr. Blanchard's mould-plough, at less than half the expence, and with equal regularity and success.

The Norfolk Husbandry is, as Mr. Young has justly observed, quite a system, every successive part of which is dependant on the foregoing, and therefore it will not admit of much variation.

As every thing depends on the success of turneps, their success depends on good hoeing. They are the only fallow in our usual course: nor can we change them for a mere fallow, because the sheep, kept to fold, and to feed off the clover and ray-grass, would then starve. We give four ploughings for turneps, and hoe them well twice. They often, with this culture, prove worth five guineas an acre. The principal part of the crop is drawn and carried into farm yards for fattening beasts; the remainder we feed off with sheep and lambs, which clear the land of every part of them.

We generally mow the first and second growth of clover; not merely on account of the hay, but because, by repeated experience, we are convinced the wheat which follows is far better than it would be after seeding.

Soaper's ashes are laid on strong wet lands with great success; and also on pastures as a top dressing in the beginning of April.

Malt-dust and foot are used on meadows, and answer well; the latter is purchased at high prices from Norwich.

The winter food of cows is chiefly turneps and straw, in the farm yards, which are kept well littered with chapped stubble and straw.

We reckon six horses necessary for one hundred acres of arable; and with two in a plough we till two acres in a day; five or six inches deep. Stubbles for fallow are ploughed in during autumn—this also destroys the weeds.

A good dairy maid with us will take proper care of twenty cows; and to every cow our best farmers keep one hog.

The common mode of estimating the expence of taking a farm is, that three rents will about stock it, or four very completely.

In some parts of this county considerable quantities of cole-seed are raised; we hand hoe it like turneps, and by that means nearly double the value of the crop.\*

Our broad clover sometimes produces near three tons the first cutting per acre. Nonsuch, ray-grass, and small white clover, are an excellent mixture to lay down dry lands with; and yield the sweetest hay.

Near the coast great quantities of sea-weed, or Goze, are collected, and used as manure to good purpose. We mix it  
in

\* An Essex gentleman informs us, that he sows cole-seed in drills, one foot or fourteen inches apart; and that by this method the largest quantity, and the best seed are produced.

in compost with earth and lime, or marle and dung, for one year, and then lay it on arable land. Our best farmers beat thistles and nettles, and mow the weeds in their borders, ditches, and the adjoining roads, lanes, and commons, before they seed, and burn them to ashes; the ashes are used as a top dressing for their meadow-lands. This is excellent management, and worthy of general imitation; for it saves infinite labour the succeeding spring in the fields adjoining.

Most of the farmers round Norwich carry dung to the distance of ten or twelve miles. They load a waggon for two shillings, or a cart with three horses for one shilling.

A great deal of buck-wheat is sown here as a preparation for wheat, and answers well.

Six pecks are sown per acre, and the average produce is from three to four quarters. The price is generally the same as that of barley, and it is an excellent fattening for swine and poultry.

Many of our farmers have cultivated lucerns with success on good rich lands. On a poor soil it seldom answers well.

Two-wheeled ploughs are used in general, as being most easy and expeditious; but in heavy lands they use swing-ploughs, and two horses always do the work. We should smile at the folly of putting four horses to a plough in any soil, because we know it to be unnecessary, except where the land abounds with stone.

I am, &c.

[The preceding Letter abounds with much useful information, and the writer seems thoroughly to understand his subject.]

*Kentish Agriculture, (being Answers to the Society's printed Queries) transmitted by the Rev. Mr. Hill, of East Malling, near Maidstone in Kent. From the Bath Society Papers, Vol. III.*

GENTLEMEN,

In reply to the queries sent to me by your Secretary, I send you the following answers. Permit me to repeat my best wishes for the prosperity of your Society, and the success of their very laudable endeavours to promote the advancement of agriculture; and to assure you that I am, with great sincerity,

Your most obedient servant,

DANIEL HILL.

East Malling, July 16, 1785.



*Query 1st.* What are the best soils from which you generally obtain the best wheat, barley, pease, oats, beans, vetches, turneps, and cabbages; and what are the usual quantities of seed sown, and the average produce per statute acre, Winchester measure?

*Answer.* Our best crops are generally obtained from hazel loams; and if they are somewhat stiff and inclining to clay, the better. On such lands, the use of heavy large harrows and rollers in the spring, to break and pulverize the soil, cannot be too much recommended. When the lands are so pulverized, we frequently get of wheat from four to five quarters, beans from five to seven quarters, barley and oats six and often seven quarters per acre.

The quantity of seed generally sown per acre, is, of beans, pease, wheat, and barley, three bushels; of oats, from four to five bushels.

*Query 2d.* What is the usual course of crops adopted by your best farmers on the different soils?

*Answer.* Our best lands never lie fallow; and the order of our crops is,

1st. Wheat;

2d. Barley, or oats;

3d. Pease, or beans; the latter always in rows, hand-hoed twice with a two-inch hoe near and between the beans, horse-hoed twice, and lastly earthen with a horse-hoe. After the beans are off we plow shallow with a broad-share, and harrow up, and burn the weeds if any remain; thus preparing a good tilth for wheat.

On our ordinary, stony, or stone shattery (stone brash) land, our course of crops is different.

1st. Wheat.

After that (before Michaelmas) sow winter vetches or rye, and eat them off with sheep and bullocks in the spring.

Then plough for turneps three or four times, each time harrowing off and burning the weeds; then sow on forty cart-loads of dung per acre. Sometimes, in a kindly season, we get a good crop of turneps after early sowing.

Oats and barley will produce (especially oats) from five to seven quarters per acre, after a good turnep season, and the crop well fed off with sheep, especially if good hay and oil-cake be given them at the same time.

With barley and oats we sow clover; next year wheat, and lastly turneps.

*Query 3d.* What manure now generally in use do you find most

It is not surprising, that in a country where agriculture is arrived to such perfection, farmers should sow three bushels of wheat per acre? Certainly two bushels, sown in the broadcast way, would be fully sufficient.

most serviceable, on the following soils respectively, viz. stiff clays, light sand, gravelly, moory, cold and wet, or what is called stone-brash land? In what quantities are the several manures laid on per acre; at what season, and how long will each last without renewal?

*Answer.* On stiff clays or sand, or gravelly cold wet land, lay marle or chalk early in the winter, at the rate of eighty cart-loads per acre, which will last twenty years; besides this, dung and lime are sometimes added.

*Query 4th.* Have you discovered any new manure more efficacious than those generally used, and which may easily be obtained in large quantities? If so, what is it, when and how applied.

*Answer.* Dung made by fat bullocks, fed on hay and oil-cakes, and of sheep, fed on the same on turnep-lands. Large oxen will eat twenty pounds of oil-cake per day, but Welch heifers will thrive well with half the quantity.

*Query 5th.* What is the best top-dressing for cold wet pastures which cannot easily be drained?

*Answer.* Wood-ashes, coal-ashes, with fowls or pigeons dung, spread thin.

*Query 6th.* What materials do you find best and most lasting for covered drains or land ditches?

*Answer.* Ragged stones or brick-bats, or rather flat stones, two set on edge eight or ten inches asunder and a third over; and where these cannot be had, black thorn or other bushes. Some persons use turf with the grass side downwards, leaving a hole below for the water.

*Query 7th.* What are the kinds of wood which you have found from experience to thrive best on bleak barren soils, cold swampy bogs, and black moory ground?

*Answer.* Scotch firs on bleak barren soils, especially in a northern aspect. On cold swampy bogs, the Dutch willow will do great things; but ash will succeed better, and is far more useful and profitable.

*Query 8th.* What are your methods of raising lucerne, sainfoin, and burnet; on what lands do you find them to answer best; and what the average produce?

*Answer.* Lucerne succeeds best in drills one foot asunder,\* and kept clean by a small plough drawn by one horse. Sainfoin flourishes most on chalky and dry stone-shattery land, on which it will produce two tons per acre on an average, for fourteen or fifteen years. Burnet is in disgrace with us, and generally had as useless.

*Query*

\* We apprehend a distance of at least eighteen inches would be better; and occasion less damage to the plants by the horse going between the rows. From various experiments made to ascertain the best distance between the rows of lucerne, the finest and heaviest crops have been from rows two feet apart.

*Query 9th.* How is your turnep husbandry conducted, and what is the best method of preventing or stopping the ravages of the fly on the young plants?

*Answer.* The first part of this query is answered in the second. To prevent the ravages of the fly, some good is sometimes done by running a light roller over them with a bundle of black thorn fastened behind it.

*Query 10th.* Do you prefer the drill to the broad-cast method of sowing grain; in what instances, and on what soils?

*Answer.* When lands are foul and weedy, the drill is certainly preferable to the broad-cast; as by that means, the horse-hoe may be used.

*Query 11th.* What is the comparative advantage of using oxen instead of horses in husbandry?

*Answer.* Where a farm consists of arable land and good pasture, the use of oxen is deemed preferable to that of horses, where men can be procured to drive them.

*Query 12th.* Omitted.

*Query 13th.* What new improvements have you made, or adopted, in implements of husbandry?

*Answer.* Our improvements in implements of husbandry have of late years been great and various, particularly in drill ploughs, which, by dropping the seed regularly, and depositing it at a proper depth, save a great deal of grain. Of carts we have a great variety, some for dung made strong with two wheels for two horses, and three wheels for one horse, and others of lighter kinds.

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I submitted your queries to a very skilful farmer, from whom I received the following answers, for land of a middling kind:

To the first *Query.* We have most wheat, beans, and vetches, if in proper tilth, from stiff land. The most barley, pease, and oats, from a lighter soil. Wheat, on an average, twenty-eight bushels per acre. We sow three bushels. One sack of barley sown per acre produces five quarters after turneps. Five bushels of pease per acre produce from three to four quarters. Four bushels of beans, and five bushels of oats per acre, produce from five to six quarters. Vetches, &c. sowed off, make a good wheat season.

2d. *Query.* A clean fallow, and sowed with clover; after clover, wheat or beans the ensuing spring on one earth. Turneps on four ploughings and dunged; hand-hoeing twice. Then barley and clover; next wheat.

3d. *Query.* Our best manure is dung from beasts fattened with oil-cakes, and fit for all soils. We lay on sixty cart-loads per acre, (each cart holding thirty bushels of coal) which, for turneps or wheat, will last six years.

5th *Query*. Wood-ashes are the best, and will kill rushes.

6th *Query*. Green alder poles, such as we use for hops, sixteen or eighteen feet long, two at the bottom and one at top; or green black thorn covered with heath, or loose stones, will do.

7th and 8th *Queries*. The same answer as from Mr. Hill.

9th *Query*. For ploughings, sixty cart-loads of dung, and hoe twice.

10th *Query*. Same answer as from Mr. Hill.

12th *Query*. Kill your sheep as soon as the rot appears.

*The Course of Crops in Norfolk. From Young's Eastern Tour: Vol. II.*

**N**O fortune will be made in Norfolk by farming, unless a judicious course of crops be pursued. That which has been chiefly adapted by the Norfolk farmers is, 1st. turneps, hoed two or three times; 2d. barley; 3d. clover; or clover and ray-grass; 4th. wheat.

Some of them, depending on their soils being richer than their neighbours (for instance, all the way from Holt, by Aylsham down through the Flegg hundreds) will steal a crop of pease or barley after the wheat; but it is bad husbandry, and has not been followed by those men who have made fortunes. In the above course, the turneps are (if possible) manured for; and much of the wheat the same. This is a noble system, which keeps the soil rich; only one exhausting crop is taken to a cleansing and ameliorating one. The land cannot possibly in such management be either poor or foul.

The only variations are in the duration of the clover; which extends, from one year to three or four. On the first improvement, ray-grass was generally sown with it, and it was left on the ground three or four years: but latterly they sow no more ray-grass than merely sufficient for their flocks, and leave it on the ground. The rest of their clover crop is sown alone, and left but one year. Opinions are not clear on these variations. Some think the modern method an improvement; others, that the old one was better.

If I may be allowed to hazard an idea on this point. I should venture to condemn the ploughing up the clover the first year; and for these reasons. It is exhausting the land more: Two crops of corn in four years, exhaust much more than two in five years: hence appears to me the modern necessity of buying oil cake at two guineas an acre. The marle is lost sooner in this method, for that subside in exact proportion

tion to the quantity of tillage in a given time. It does not sink while the land is at rest ; but while it is pulverizing by the plough. Lastly, the stock of cattle is less, consequently the quantity of dung inferior ; instead of folding twenty-five acres, only twenty are done. They do not pretend that the wheat after a lay of two years is worse than after that of one—but they say it is not so clean. I admit that there will be more trouble in cleaning the turnep fallow of twitch ; but let that trouble be carried to account, and it will not balance the counter-advantages. Besides, the best farmers agree, that if the turnep fallow is well executed ; the plants twice well hoed, and the land sined thrice for barley ; that, then the clover lying two years, will not give a foul crop of wheat. Twitch generally comes from some neglect.

#### *Turneps.*

Every link of the chain in Norfolk husbandry has so intimate a connection and dependance, that the destruction of a single one, ruins the whole. Every thing depends not only on turneps, but on turneps well hoed ; an assertion that will receive but little credit in various parts of the kingdom.

Turneps on well manured land, thoroughly hoed, are the only fallow in a Norfolk course ; it is therefore absolutely necessary to make it as complete as possible. They cannot be changed for a mere fallow, because the stock of sheep kept for folding, and eating of the clover and ray-grass ; and farm-yard cattle would then all starve ; and add to this, that the tillage during the latter part of the summer, &c. which must be substituted instead of them, would pulverize the sands too much, which are greatly improved by the treading of the cattle that eat the crop off. In a word, the improved culture of this plant is so important to the Norfolk husbandry, that no other vegetable could be substituted that a common farmer would cultivate.

#### *Clover and Ray-Grass.*

This also is another article that could not possibly be dispensed with. The light parts of the county have neither meadows nor pastures ; their flocks of sheep, dairies of cows, their fasting beasts in the spring, and their horses all depend on these grasses, and could subsist by nothing else ; nor could they raise any wheat without this assistance.

Their soil is too light for that grain before it is well bound, and matted together by the roots of the clover, which are at the same time a rich manure for the wheat : A fallow instead of clover would be worse than nothing, it would render the land much too light. For these reasons, which certainly are decisive, nothing could be done here without clover.

*Field System in Gloucestershire. From the Bath Society Papers.  
Vol. III.*

ON THE SIX-FIELD SYSTEM

**A**S I have tried different systems of agriculture, and found the following method best adapted to our poor lands, I have taken the liberty to present you with an account of it.

It is what we generally call a six-field system. As I look upon turneps to be the grand basis upon which the best superstructure of practical husbandry can be raised, I shall begin with them.

First year, Turneps,

Second year, Barley, with grass seeds.

As our lands have been sown so frequently with broad clover as to become tired with it, I have substituted the following mixture in its place, viz. four pounds of white Dutch, six pounds of marl grass, and one bushel of hop and ray grass, which I have found to succeed.

Third year, Grass,

Mown, not suffering any cattle to be depastured on it later than October, as I have seen many a good plant of grass destroyed by winter feeding.

Fourth year, Feed.

Fifth year, Wheat.

The land lying under grass two years, it gets close, and is a means to prevent the wheat from what is generally called foundering in the spring.

Sixth year, Oats;

After which, Turneps.

As the getting a crop of turneps is the foundation on which you may most reasonably build your future hopes of success, it is a part of husbandry to which the farmer cannot pay too much attention.

The method I advise is, to carry all the rotten dung and manure upon your oat stubbles immediately after harvest, (which should be the dung made in your courts the preceding year) after which plough it in; give another ploughing in March if possible; you will then be provided for an early sowing,

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This six-field system, or system of a course of crops for six years, is an excellent one, and its utility is further proved by the general practice of the best farmers in Suffolk and Norfolk, upon similar soils; but it is customary in these counties to break up the layer in the spring of the fifth year, and dibble in pease; and sow wheat in the sixth year after the pease; as they find the wheat generally better after a crop of pease, than when sown or planted upon the layer; and they think the land less exhausted by a crop of pease succeeded by wheat, than by a crop of oats following the wheat.

sowing, which in my opinion, is the most probable way of succeeding in your turnep crop.\*

As turneps upon poor land cannot be raised without dung, I take it to be the farmer's interest to collect as much as possible, not suffering any straw, haulm, or stubble, to pass without being converted to manure; as upon the quantity and application of that depends in a great measure his future success.

The wheat stubble [haulm] should be mown and collected together to some convenient place, as near to the land intended for turneps the next season as convenient; and, being stacked round the sheep-fold, will not only be of great benefit to the cattle as a shelter, but will be found very useful as a comfortable lodging for them.

I am aware of one objection that may be made to this method of bedding up cattle all the winter, which is, that the heat arising from the fermentation will make the cattle tender and delicate in their constitutions; but this, like many other things which at first appear an evil, may by proper attention be converted into the greatest good, by laying on at proper times a layer of earth or mould from ditches, highways, &c. †

After the compost has early in the spring been turned up, this fermentation will be found to have converted it to a valuable heap of manure, and its vicinity to the land where it is intended to be used must still add to its value.

If manure should be conveniently procured to give a top-dressing to the grass-seed, as soon as the corn is carried, I am persuaded the farmer would be amply paid for his expences in the succeeding crop.

I beg leave to subscribe myself, with best wishes for the prosperity of the Society

Your most obedient

And obliged servant,

THOMAS ROBINS.

*Bold-Down, Gloucestershire, January 7, 1785.*

*Review*

\* The propriety of manuring the land for the turnep crop is indisputable; but if the dung be laid on the stubble directly after harvest, it will lose much of its strength before the season of turnep sowing. The Suffolk and Norfolk farmers generally carry their manure out of their farm-yards in the spring, as soon as the cattle quit them; and by turning it over once a month afterwards, it becomes sufficiently rotten to be laid on the ground immediately before the turneps are sown. By this method abundant crops are produced.

† Such a fixed fold may be of great use when the weather is too bad to fold the stock in the fields; at other times the land will be more benefited by folding the sheep upon it.

*Review of Intelligence concerning Clover, From Young's Eastern Tour. Vol. IV.*

**I**N this review, clover must not be forgotten; the use it is of to many parts of the kingdom is so great, as to be one of the pillars of good husbandry; and yet it has not been able to make its way through all the counties: this grass is so truly serviceable to the farmer, that a clear knowledge of its product and value are the only means of spreading the culture, and of improving it where known.

The importance of a grass that is of so hardy a nature, as to bear sowing with corn, and subject to scarcely any failure,—that will the very first year yield 3 Ton 4 Cwt. of hay at two mowings—that will last one or perhaps two years longer, if it suits the farmer,—that is for wheat a better preparation than the finest fallow, requiring at the same time but one ploughing—all these circumstances unite to render clover an object of the highest consequence to these kingdoms; and cannot but amaze one to reflect, that there are various parts of them, wherein it is yet unknown. And it is miserable to think of so many common fields yet remaining where the farmers are tied down to most unprofitable courses to the exclusion of this noble grass.

Nor let it be forgotten, that these advantages are gained by a crop, which may be all, and usually is, consumed by cattle at home; hence opens new views of its profit: the farmer is enabled to keep great stocks of cattle on soils, where he could not otherwise have any; raising much dung, and keeping his land in great heart.

The comparative advantage of the two applications of the clover, mowing and feeding is in favour of the former. I am not surpris'd at this, for mowing will always make the land cleaner from weeds, an effect particularly observ'd at Hastead; but the shade of a thick crop is the great object in summer, be it what it may, it will breed so putrid a fermentation in the soil, as to work a far greater and infinitely more regular improvement, than the random dunging and staling of cattle. All experience proves the benefit of thick shade in summer. That this comparison may be the better understood, I shall compare the practice with the soil.

*Review of Intelligence concerning Carrots. From Young's Eastern Tour. Vol. IV.*

**C**ARROTS in the minutes of this Tour make a distinguished figure: I met with so many experiments on

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\* I have treated the point of feeding and mowing meadows at large, in my course of Experimental Agriculture, Vol ad. p. 272.



this most excellent root, that I think there is great reason to expect it will soon become common husbandry; which would be one of the most fortunate circumstances that could possibly happen to the agriculture of Britain. It has been tried in scarcely any place without being adhered to: Indeed, we may safely pronounce that whoever does justice to it in the cultivation, will certainly find it one of the most profitable crops in the world; but a review of the particulars bringing the most material points into one view, will best prove the truth of this assertion.

*Mr. Moody, Retford.*

*Soil.* Rich sand at 40s.

*Culture.* Ploughed 12 inches deep; hand-hoed clean, 9 inches asunder.

*Product.* 20 Tons at 20s; also 25 Tons at 20s.

*Use.* Fattening of oxen of from 80 to 110 stone; four beasts to an acre 14 weeks. No food fattens better; as well as oil cake.

*About Norwich.*

*Soil.* A sandy loam, 16s.

*Culture.* French ploughing; manure with 10 loads of long dung, Three hoeings at £.1 1s od.

*About Saxmundham.*

*Soil.* Rich sand; at 14s.

*Product.* 800 Bushels.

*Use.* Fattening hogs, and feeding horses.

*About Woodbridge.*

*Soil.* Rich deep sand, at 20s.

*Culture.* French ploughed 12 inches deep; no manuring. Three hand hoeings, at from 16s. to 21s. per acre.

*Product.* 698 Bushels, at 6d. £.17 9s od.

*Use.* Feeding horses; allow 2 bushel per horse per day, and give no corn. And fatten hogs completely.

These products are great and shew plainly, that carrots will yield a very considerable quantity of food. Eighteen tons the average quantity of so rich and solid food must go very far in fattening or keeping any kind of cattle.

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*Review of Intelligence concerning Potatoes. From Young's Eastern Tour. Vol. IV.*

**T**HE culture of Potatoes is another article of husbandry highly deserving the attention of all persons, who are desirous of advancing their husbandry to perfection. The following minutes will shew, that few crops can in profit be ranked with them.

*Mr.*

*Mr. Kendal, at Alfrston.*

*Soil.* Dry crumbling loam on quarries at 20s.

*Culture.* Kept clean by hoeing, &c.

*Product.* Six hundred bushels, at 1s. £. 30.

*Use.* Applies all to fattening brawns, boils them, and mixes two bushels of rye or barley meal to 20 of potatoes; more fattening than corn alone.

*Mr. Wharton, Doncaster.*

*Soil.* Rich sand, at 50s.

*Culture.* Plants in equally-distant rows, three quarters of a yard asunder; manures with twelve loads an acre rotten dung; only the knots or eyes used for sets; earthed up with hand-hoes several times.

<i>Produce.</i> 1767,	_____	242 bushels.
1768,	_____	242
1769,	_____	300
1770,	_____	719

Total 1593

Average 375

At 1s. 4d. - - - £. 24 16 6.

*Use.* Applied chiefly to fattening swine; fats porkers with them, and mixes half a peck barley meal to six bushels of potatoes; also in half fattening bacon hogs.

These products are very considerable; £. 26. an acre on a crop, which like carrots are kept quite clean, and generally manured for very richly, which consequently cleans the land, and as every one knows, greatly improves it, forms upon the whole an object of uncommon importance; and shews that the culture of potatoes cannot be too much promoted.

*Instructions for raising of Potatoes. From the Bath Society Papers. Vol. III.*

GENTLEMEN,

A PREMIUM having been offered by the Bath Agriculture Society, for the cultivation of potatoes by farmers, &c. whose rent does not exceed forty pounds per annum, and the increase of that valuable root being of great consequence to the poor, I flatter myself it will not be thought impertinent in me to give some instructions for the raising them to advantage.

As I shall point out various methods it may be right to inform those who have only a small spot of ground, how they may obtain a plentiful crop.

First, then, the earth should be dug twelve inches deep, if the soil will allow of it; after this, a hole should be opened about six inches deep, and horse dung, or long litter, should be put therein about three inches thick; this hole should not be more than twelve inches in diameter; upon this dung or litter, a potatoe should be planted whole, upon which a little more dung should be shaken, and then earth must be put thereon.

In like manner the whole plat of ground must be planted, taking care that each potatoe be at least sixteen liches apart; and when the young shoots make their appearance, they should have fresh mould drawn round them with a hoe; and if the tender shoots are covered, it will prevent the frost from injuring them; they should again be earthed when the shoots make a second appearance, but not be covered, as it all probability the season will then be less severe.

A plentiful supply of mould should be given them, and the person who performs this business should never tread upon the plant, or the hillock that is raised round it, as the lighter the earth is, the more room the potatoe will have to expand.

I obtained the last year from a single root thus planted very near forty pounds weight of large potatoes, and from almost every other root upon the same plat of ground from fifteen to twenty pounds weight; and I will venture to assert, that, except the soil be stoney or gravelly, ten pounds or half a peck of potatoes may almost always be obtained from each root by pursuing the foregoing method. But note, cuttings or small setts will not do for this purpose.

The second method will suit the indolent, or those who have not time to dig their ground, and that is, where weeds much abound and have not been cleared in the winter, a trench may be opened in a strait line the whole length of the ground, and about six inches deep; in this trench the potatoes should be planted about ten inches apart; cuttings or small potatoes will do for this method. When they are laid in the trench, the weeds that are on the surface may be pared off on each side about ten inches from it, and be turned upon the plants; another trench should then be dug, and the mould that comes out of it turned carefully on the weeds. It must not be forgot, that each trench should be regularly dug, that the potatoes may be throughout the plat ten or twelve inches from each other. This slovenly method will in general raise more potatoes than can be produced by digging the ground twice, and dibbling in the the plants; and the reason is, that the weeds lighten the soil, and give the roots room to expand. They should

should be twice hoed, and earthed up in rows. And here note, that if cut, potatoes are to be planted, every cutting should have two eyes, for though fewer sets will be obtained, there will be a greater certainty of a crop, as one eye often fails or is destroyed by grubs in the earth.

Where a crop of potatoes fails in part, (as will sometimes be the case in a dry season) amends may still be made by laying a little dung upon the knots of the straw or haulm of those potatoes that do appear, and covering them with mould, each knot or joint thus ordered will, if the weather prove wet afterwards, produce more potatoes than the original roots.

I have raised potatoes from the apples that grow upon the haulm, but they were very small the first year, though I found them much increase in size, when they were planted again the second year; but I do not think they will ever answer any good purpose.

I obtained the last year from the smallest potatoes planted whole, from four to six pounds at a root, and some of the single potatoes weighed near two pounds.

These were dug in as beforementioned, in trenches where the ground was covered with weeds, and the soil was a stiff loamy clay. I know these small potatoes are held in contempt for planting, by those whose prejudice will not suffer them to try experiments; but I can assure them, that they will upon trial fully answer their expectations; though I advise by no means to dibble in potatoes, as the person who uses the dibbles treads the ground, and prevents the young fibres from properly expanding.

A good crop may be obtained by laying potatoes upon turf at about twelve or fourteen inches apart, and upon beds of about six feet wide, on each side of which a trench should be opened about three feet wide, and the turf that comes from thence should be laid with the grassy side downwards upon the potatoes; a spit of mould should next be taken from the trenches and be spread over the turf, and in like manner the whole plat of ground that is designed to be planted, must be treated. And remark, that when the young shoots appear, another spit of mould from the trenches should be strewed over the beds so as to cover the shoots; this will prevent the frost from injuring them, encourage them to expand, and totally destroy the young weeds; and when the potatoes are taken up in the autumn, a careful person may turn the earth again into the trenches, so as to make the surface level; and it will be right to remark, that from the same ground a better crop of potatoes may be obtained the following year.

For field planting, a good (if not the best) method is to dung the land, which should be once ploughed previous there-

to; and when it is ploughed a second time, a careful person should drop the potatoe plants before the plough in every third furrow at about eight or ten inches apart. Plants that are cut with two eyes are best for this purpose. My reason for planting them at so great a distance as every third furrow, is, that when the shoots appear, a horse-hoe may go upon the two vacant furrows to keep them clean; and after they are thus hoed, they should be moulded up in ridges; and if this crop be taken up about October or November, the land will be in excellent condition to receive a crop of wheat.

Lands that are full of twitch or couch grass may be made clean by this method; as the horse-hoeing is as good as a summer fallow; and if, when the potatoes are taken up, women and children were to pick out such filth, not any traces of it would remain; and by laying it on heaps and burning it, a quantity of ashes would be produced for manure.

After ploughing, none should ever dibble in potatoes, as the persons who dibble, plant, or hoe them, will all tread the ground, by which means it will become so bound, that the young fibres cannot expand; nor did I ever hear, that from the dibbling method, more than fifty or sixty sacks were produced from one acre; whereas, by ploughing them in as before-directed, I have obtained more than one hundred-sacks per acre.

Indeed, I have known good crops obtained by ploughing the land twice, and dropping the plants in every other furrow, and by hand-hoeing and earthing them up afterwards as the gardeners do pease; but this method is not equal to the other. Vacant places in hedge-rows might be grubbed and planted with potatoes, and a good crop might be expected, as the leaves of trees, thorns, &c. are a good manure, and will surprisngly encourage their growth, who, by cultivating such places; will then make the most of his ground, and it will be in fine order to receive a crop of corn the following year.

I shall now conclude by noting, that gravelly, stony, chalky, or stiff clay land, will never produce many potatoes; and the few they do produce, will be cankered and only fit for pigs; it is therefore obvious, that such soils are improper.

If these loose hints are worthy the acceptance of the Bath Agriculture Society, I am happy in having the honour of communicating them, and am,

With great deference,

Your obedient servant,

JOSEPH HAZARD.

Stoney-Littleton, Feb. 18, 1786.

On

*On the Necessity of hoeing Turneps. Addressed to the Farmers in the West of England. From the Bath Society Papers. Vol. III.*

**N**OTHING sounds so wonderful to East-country farmers as hearing of the conduct of their brethren in the West, who do not hoe their turnep crops. Long and universal practice has given the East-country farmer the most complete conviction, not of the propriety only, but of the absolute necessity of this operation.

Without hoeing, we should get a produce on our best lands of, perhaps, two, three, or at most four tons on an acre, and that chiefly leaf. With hoeing, we get from twenty to thirty-five tons of root only; and if leaf were an object, much more than is ever gained without. The difference in the mere quantity of the crops, therefore, would alone be an argument powerful enough to be persuasive to men who will give their understandings any play; but there are other circumstances not less important, that ought to be taken into consideration.

The hoeing not only thins the turneps, and makes them large, but it destroys all weeds that may have risen in the field from the last ploughing; a second hoeing repeats this; and in favourable seasons a third may be given; so that one great object (the greatest in my opinion) of summer following, that of killing weeds, is better answered than it can be by ploughing. Whoever will coolly consider this point, cannot fail to admit the great efficacy of this improved husbandry.

I must still view this object in yet another light. Summer following is attended in various cases with a very bad effect. There is reason to believe, that the action of the sun-beams impoverishes the land when in tillage. It volatilizes and exhales those finer particles, on which depend, or with which is connected, the food of plants; but where husbandry is very ill understood, and the farmers have no correct ideas of the due arrangement of crops, this evil is properly submitted to, in order to effect the destruction of weeds by ploughing. How valuable then is the turnep culture, which by means of hoeing destroys the weeds, and at the same time covers the land from the action of the sun, in those months which are oftentimes the hottest in the year!

If the land be well tilled and pulvvered, I am inclined to think, that many weeds may rather be propagated than killed by the turnep husbandry without hoeing; for if the ploughings be given in a quick succession, the roots and seeds will be tumbled about too fast for vegetation, and when the land is sown and left to repose, they will grow very fast, and if no

hoeing follow, the successive crops will, by their weedy appearance, shew that little benefit is derived from this very imperfect management.

That the right conduct is to hoe, cannot be doubted; but the question is, how to enforce it? Your excellent Society of true and genuine patriots have done much in almost every branch of husbandry; nor has this object been neglected by them: But probably, the best means of disseminating the practice, will be found that of importing a few good hoers from Suffolk, [the best part of the county for such a purpose is the angle between Woodbridge and Orford] and give premiums for all the hands they instruct, and to all that are instructed by them; with an honorary reward to that gentleman who shall import one or more for the same purpose. Perhaps this subject deserves a further attention previous to the next season.

ARTHUR YOUNG.

*An Account of an Experiment in the Cultivation of Buck-Wheat, [Fagopyrum] at Brislington. From the Bath Society Papers. Vol. 1.*

GENTLEMEN,

**B**ETWEEN the 14th and the 21st of June 1783, I ploughed a piece of land on Brislington common, containing about twelve acres.

It was harrowed in the direction of the plough. Two bushels per acre were then sown, and a roller was run over it. Nine acres of this ground is a reddish sandy loam; the other three acres a wet clay, which, for want of draining, was somewhat poachy. The former produced a most luxuriant herbage, which effectually got the mastery of every kind of weeds; even the quick-shooting fern could not keep pace with it.

The remaining three acres of clay failed very much; there not being on the whole so much herbage as on a single acre of the other. The crop was harvested the beginning of September; and produced upwards of twenty waggon loads of straw, and only two hundred and thirty bushels and half of grain, nearly twenty bushels per acre.

Between the 8th and the 22d of October following, the same ground was sown with red lammas wheat, two bushels to an acre. It had one ploughing, after which the grain was eared in; the ridges dressed or righted, by closing the furrows, and trimming the loose earth.

In that part of the land where the buck-wheat had failed,  
the

the wheat failed also; and that as exactly as it is possible to imagine.

The produce of this crop was two hundred and eighty three Winchester bushels and half.\*

Some years preceding this experiment, I had made chiefly to further the views of the Agricultural Society) I have been in the culture of buck-wheat in various soils, and at various times of the year, from the beginning of April to the 22d of July.

The result of my observations is, that the cultivation of this grain is well worth the husbandman's attention; that it delights in a mellow sandy soil; and succeeds well in any dry, loose, healthy land, and moderately so in a free loamy stone brash. A stiff clay is its aversion, and it is entirely labour lost to sow it in wet poachy ground.

The most proper time for sowing it, I find to be from the middle of May to the middle of June. I would choose rather to sow it even in the beginning of July, than before the middle of May; for it is very impatient of cold in its first vegetation.

A crop of buck-wheat is, in my opinion, so much clear gain to the farmer, seeing that the land is thereby so well prepared for a succeeding crop, even better than a fallow; besides that it affords a noble resource for raising manure.

I am, &c.

NEHEMIAH BARTLEY.

*Bristolington, February 10th, 1785.*

*On the Situation and Soil for Orchards; and the Method of planting Apple Trees. From Marshall's Rural Economy of Gloucestershire. Vol. II.*

**A**SPECT is of much more importance, here, than locality, and appears to have had due weight in fixing the sites of orchards, in this district; for though orchards are found on every side of hills, the south-east, with a skreen to the north, seems to be the favourite aspect.

The "morning sun" is esteemed genial to fruit: an old idea; and not merely a popular notion; though in some degree it may be deemed such.

It is not probable that the quality of the morning rays is much superior to those of the noon-day or evening sun (the popular idea); but it appears demonstrably, that a south-eastern aspect collects a greater quantity of heat, enjoys a longer day, than any other aspect.



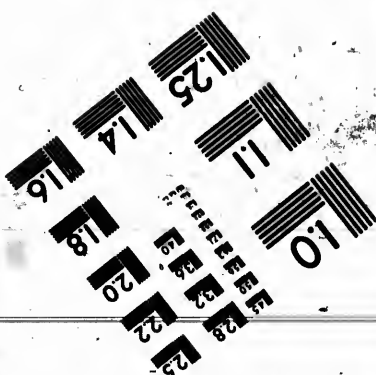
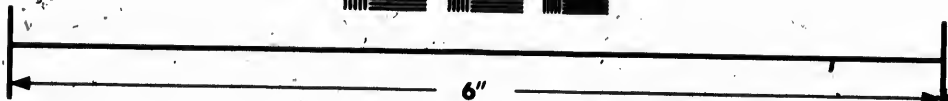
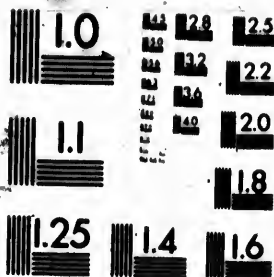
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It is noon before a western aspect reflects a ray. In the morning, it will frequently remain dewy and cold, several hours after vegetation has been roused, against an eastern inclination. The afternoon sun is, no doubt, more intense, on the west than on the east side of a hill; but its duration is short. In an afternoon, the air is every where warm; and a regular supply of warmth appears to be more genial to vegetation, than a great and sudden transition from heat to cold. The coolness of the evening comes on, and vegetation is probably checked as soon, or nearly as soon, in all aspects. Hence we may, I think, fairly conclude, that the south-eastern aspect enjoys more vegetative hours, and receives a more regular supply of heat, than any other aspect.

Nevertheless, on a fruit-liquor farm, it may be prudent to have "plantations" in different aspects. Blights (whatever they are) appear to be communicated to the trees by the wind. In 1783, orchard-fruit was cut off in every situation, except a north-west aspect; in which I saw several orchards fully fruited.

A northern aspect, however, has its disadvantage; and although it may, in this country, especially where the soil is warm, produce fruits fit for the purpose of liquor; yet in the more northern provinces, it may be altogether inadequate to that purpose.

A hill dipping to the south partakes of the nature of a south wall. The atmosphere, a few feet from the ground, is probably many degrees hotter on the south than on the north side of a regular hill: and the richness and flavour of fruit depends much on the heat of the atmosphere it matures in. The fruit of the branch of a vine, for instance, which is introduced into a stove or green-house, is much richer and higher flavored, than that of other branches of the same vine, which remain in the common atmosphere. Hence every means should be used to render the atmosphere of an orchard as warm as may be—to collect as much heat within its area as possible. Therefore, while it enjoys the morning sun, it ought to have a tall woody screen to the east, to break off the piercing winds from that quarter. The winds travel horizontally, or nearly so; while the sun soon gains a sufficient elevation, to lodge its rays in the atmosphere of a screened orchard.

Much has been said about fruit trees in hedges, in the cyder counties. But this should seem to be one of those wild ideas, which hasty travellers are liable to catch.

Crab-trees, perhaps, are more common in the hedges of this, than they are in those of other districts; and hedge-crabs, here, as in other places, are sometimes grafted with apples; but I have met with very few instances, in which  
hedge-

hedge-rows have been designedly, and regularly, filled with apple trees. About Bromyard, I saw one or two instances, in which apple trees from close woody hedge-rows; blowing out, on either side, over the adjoining inclosures. But the practice of planting fruit-trees in hedges, I apprehend, has never been common, and is now, I believe, wholly laid aside. There are two disadvantages attend it:—the hedge is inevitably destroyed, and the fruit is difficult to collect.

2d. The soil of orchards. It appears to be sufficiently well ascertained, in this district, that the same species of fruit, when produced on different soils, affords liquors of very different qualities. The fire apple, on the limestone lands of the Forest of Dean, yields a cyder, which is marked by richness, (sweetness), and fullness of flavor: while the same apple, in the vale of Gloucester, a strong deep rich soil, affords a liquor, whose predominant qualities, without great diligence in the manufacture of it, and roughness and strength.

The Hagloe crab, too, seems to require a calcareous rock to give full richness and flavor to its liquor. The orchard, which yields the nectarious juice, that has been spoken of, has for its soil a very shallow loam, lying on a soft sandy rock—provincially a “dunstone”—which, on examination, proves to be pretty strongly calcareous; and is of a contexture sufficiently porous and loose to admit the fibrils of vegetables.

On the contrary, the squash pear draws the finest liquor from deep strong land. A plug of soil, taken beneath a pear tree, in a celebrated orchard, in the township of Taynton is a strong brown clay, without a particle of calcareous earth in its composition. Nor does the (subsoil), a still stronger red clay, shew the least marks of calcareousity.\*

This contrariety may be reconcilable in the specific qualities of these fruits.

The juice of the pear is naturally saccharine; while that of the apple abounds with acidity; and, if we may venture to reason on a subject so little understood as is that of the vegetable economy, what is more likely to lessen the proportion of acidity, than the tree which produces it feeding among calcareous earth; its natural destroyer.

From the whole of the evidence collected in this district, I am inclined to believe, that there are many situations, even in the more northern provinces, notwithstanding the disadvantage of climature—in which, with due attention to aspect, a judicious

\* I have observed a pear-tree flourish on the side of a cold Blue-Clay Swell (Lassington-hill), where the soil is so infertile that scarcely any herbage, except the wood fescue, will grow upon it; and where the native crab evidently starves for want of nourishment. There are many similar swells scattered over this district; and it is probable, that their value, (at present very inconsiderable) might be advanced manyfold, by planting them with some of the superior sorts of pear trees.

ous choice of fruit, and proper management of the liquor— even cyder of the first quality might be made.—*Perry* of a good quality, I am persuaded, might be made in almost any quarter of the kingdom.

*The Method of planting Apple Trees.*

This requires particular notice.—The ordinary method in the Gloucestershire cow-grounds, is to dig a hole, wide enough to take the roots (if not very long); which being placed within it, the mould is returned upon them in the order in which it came out; carefully replacing the sods on the surface, that no grazing ground may be lost. A mode of planting, which is too common throughout the kingdom.

A method, which is more likely to succeed is this; the ground being set out with stakes, driven in the centers of the intended holes, describe a circle, five or six feet in diameter, round each stake. If the ground be in a state of grass, remove the sward, in shallow spits; placing the sods on one side of the hole. The best of the loose mould place, by itself, on another side; and the dead earth, from the bottom of the hole, in a third heap.

The depth of the holes should be regulated by the nature of the subsoil. Where this is cold and retentive, the holes should not be made much deeper than the cultivated soil.—To go lower is to form a receptacle for water, which, by standing among the roots, is very injurious to the plants. On the contrary, in a dry light soil, the holes should be made considerably deeper; as well to obtain a degree of coolness and moisture, as to be able to establish the plants firmly in the soil. In soils of a middle quality, the hole should be of such a depth, that, when the sods are thrown to the bottom of it, the plant will stand at the same depth in the orchard, as it did in the nursery. Each hole, therefore, should be of a depth adapted to the particular root, which is to be planted in it. The holes, however, ought for various reasons, to be made previous to the day of planting.

If the season of planting be spring, and the ground and the weather be dry, the holes should be watered, the evening before the day of planting, by throwing two or three pailfuls of water into each: a new, but an eligible practice.

In planting, the sods should be thrown to the bottom of the hole; chopt with the spade; and covered with some of the finest of the mould. If the hole be so deep that, with this advantage, the bottom will not be raised high enough for the given plant, some of the worst of the mould should be returned, before the sods be thrown down.

The bottom of the hole being raised to a proper height; and adjusted; the lowest tire of roots are to be spread upon

it: drawing them out horizontally; and spreading them, in different directions, as the bird spreads its foot when it stands on a level surface: drawing out the rootlets and fibres, which severally belong to them; spreading them out as a feather, or as the frond of the fern;—pressing them evenly into the soil, and covering them, by hand, with some of the finest of the mould: one person steadying the plant; another adjusting and bedding the roots; and a third supplying the mould; which being raised high enough to receive another root, or another tire of roots, they are to be spread out horizontally upon it, and bedded in a similar manner: thus continuing, until every foot be bedded, separately, horizontally (or so near what declining) freely, yet firmly, among the best of the soil: great care being had to work the mould well in, by hand, among the roots beneath the crown, that no hollowness, nor false filling may be left: to prevent which, the mould, after the roots are all bedded, and covered some depth, should be pressed, or trodden hard (according to the nature of the soil and the state of the season) with the foot: the remainder of the mould being raised into a hillock round the stem; for the tripple use of affording coolness, moisture, and stability to the plant.

In forming these hillocks some little skill is requisite. The soil ought not to press against the stem much higher, in the orchard than it did in the nursery: yet it is proper that there should be a descent for rain water, from the stem; not toward it. To this end a dimple or little dish should be made on the top of the hillock; and, from the rim of this, the slope should be gentle to the circumference of the hole; where the broken ground should sink some few inches below the level of the orchard.

Much of this will, no doubt, be deemed tedious and unnecessary: by those, I mean, who have been accustomed to bury the roots of plants, in the grave-digger's manner: but I can recommend every part of it, to those who wish to ensure success, from my own practice; in which this method of bedding the roots arose; and in which only, I believe it has been used.

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*From the Museum Rusticum, Vol. II. A Letter to the Editors, on Cyder-Fruit and making Cyder, from a Herefordshire Planter.*

GENTLEMEN,  
**M**Y purpose is to employ, profitably I hope, a few hours in giving you the result of many years experience in the affair of cyder.

The



The worse the apple is for the table, the better it is, in general, esteemed for cyder, such as grow all over this county, and are, in a manner, wild, harsh, and crabbed to the taste.

There go under various names, as the red-streak, the white and green musts, the gennet-moyle, the stocking-apple, the summer and winter fillets, &c. &c. of all which I prefer the best, provided it is a good sort, which is not always the case, particularly in some parts of Worcester and Gloucestershire, where they grow in great plenty.

I have long laid down from experience, the best mistress, that, first, the more red an apple has in its rind, the fitter it is for cyder; that is to say, if it is at all fit; for I have seen an apple of very deep red, by some called sopsy-wine, quasi sopped in wine, which was worth nothing in this intention.

Secondly, That the paler the rind, the worse the juice.

Thirdly, I have found it a maxim in general true, that a sweet apple with a tough rind will always yield a good vinous liquor.

Fourthly, The more yellow the flesh of the fruit, the better and finer coloured will the cyder be.

These few maxims, not too scrupulously adhered to, have been of great service to me in life; for though I have high opinion of them, I do not absolutely rely on them. There is no rule but an exception may be made to it; but a man of reflection, with a few well-founded rules, will seldom be at a loss to act in this, or in any other case.

I seldom suffer my apples to be gathered till they begin of themselves to drop from the trees; nature then tells me they have, for the most part, acquired a proper degree of maturity.

Great care is taken in the gathering of them, for fear they should be bruised in the operation; and this I have always found a very necessary precaution.

As they are gathered I have them sorted, according to the several degrees of ripeness they are of, making, in general, three sorts, which a little experience easily teaches to separate properly, the difference being apparent enough at first sight.

As fast as they are gathered and sorted, they are carried under a shed prepared for that purpose, and laid in large heaps to meliorate; this practice I cannot enough recommend, as being of great service to the liquor, improving its quality, and making it keep, without comparison, better; and all this is caused by a little sweating in the heap.

Yet, good as this practice may be, some avaricious planters cannot be induced to adopt it, because, say they, the apples fresh from the tree will yield better; as, of these last, about twenty bushels will give a hoghead of cyder; whereas, of the other apples, which have been heaped, it will take about twenty-five to make the same quantity.

I suffer my apples to lie in the heap a longer or a shorter time, according to the nature of them, such as are harsh and solid requiring to lie longer, by several days, than those that are mellow and pulpy; and the degree of maturity the apples had attained before they were heaped, makes also some difference in this respect.

I have already observed, that I divide my fruit into three several sorts, according to the state of its maturity: I have now to add, that from these three sortings I have no less than six several kinds of cyder, each different from other in taste, flavour, and quality.

As fast as the fruit is ground (I need not, I think, mention that I use the ripest first) the pulp is put into a large vat near the press: at the bottom of the vat is a tap, through which a considerable quantity of the prime vinous juice will run without any pressing, induced by its own weight only; this produces my best cyder, and I always tun it up by itself: the pulp is afterwards pressed in the usual way. The same process is used in all the three sortings of apples; by which means I get, as I said before, six sorts of cyder. The first runnings from the vat I immediately put into the vessel in which it is to remain; only if it happens, by any accident, to be too foul, I strain it first. I allow here but a small vent-hole, and when it has done working I fill the vessel with some of the same liquor reserved for that purpose: I afterwards, by degrees, close the vent till it is finally and well stopped.

As to the juice, which undergoes the action of the press, I put this, as soon as it runs off, into vessels, where I suffer it to remain about thirty hours, according to the season, till the fœces are precipitated, or fallen to the bottom; after which I draw it off, and tun it up in the vessels in which it is to remain, with the precautions, however, above-mentioned, when I treated of the first runnings:

The kind of vessels I use, and which I think by far best, are upright hogsheds, broader at the upper head than at the bottom; and I often, after my cyder has done fermenting, cast two or three handfuls of wheat-bran into each vessel, which serves to thicken the head or cream of the liquor, and makes it keep better.

I am very careful with respect to the vessels into which I put my cyder, always avoiding new ones, if possible, as they give the liquor a twang, or bad taste, and hurt its colour: my usual way is, to season all my new casks, that I possibly can, with small beer, which I use in common in my family, though I live in a cyder country; and if I have not an opportunity of doing this, I scald them with water in which a considerable quantity of apple-pulp has been boiled.

If a vessel is not sweet, it may easily be cured, unless very bad indeed, by putting some unslacked lime into it, adding some cold water, stopping it close, and rolling it about till the noise within is no longer heard.

I have often found it of great use towards enlivening the liquor, to slice about a dozen sweet apples into a hoghead: I am also inclined to think it makes it keep better.

The best cyder I ever had was a few years ago, when I put in each hoghead about three quarts of good wheat, first boiled and hulled, so as to have, in some measure, the appearance of boiled rice.

When I am obliged to put any cyder into a cask I suspect, and afterwards discover it has given the liquor a bad taste, I cause some mustard-seed to be ground in a quern with some cyder: this mixture, being put into the hoghead, is often of great service, and restores it to its original good taste.

Cyder, when it is turned, is very apt to lose that fine mild spirit which renders it so pleasant and brisk a liquor; therefore great caution is to be used with respect to the vent. The wild, furious, and ungovernable spirit should be suffered to escape; which may easily be effected, by leaving a small vent open for a few days; after which the barrel must be close stopped, for if it gets any vent, the liquor will stand a great chance of being entirely spoiled; on the contrary, if well bunged, though it may dead and flat at first, it will soon recover itself, maturate, and be fit for drinking. This particular part of the management of cyder is critical, and depends greatly on the temperature of the air, so that it is impossible to give any absolute directions about it, as something must still be left to be learned by experience, and governed by discretion.

I must give one particular piece of advice to such as intend making cyder, which is, that they diligently watch the alterations in it upon every change of weather, as a small neglect, at such times, is often fatal to many hogheads, and the danger is much greater in summer than in winter. There is scarcely any disease incident to this liquor, but what may easily be cured by a timely application: if it is only a little inclined to tartness, wheat, managed as above-mentioned, will cure it; and the same thing is also very good to preserve it, when it is drawn out of one cask into another: the quantity, when the liquor is tart is about half a peck to a hoghead: I have sometimes even put a quart more.

This simple remedy will, I say, often cure the tartness I mentioned; but sometimes, when it is very thick and sourish, it may be necessary to raise a new fermentation, to purge off the impurities and make them subside: this may be soon  
done

done by bruising the flesh of a few apples to a pulp with some of the liquor, and putting the whole into the bung-hole of the vessel; this will raise a ferment, and cure the cyder: when that is over, it will be proper to draw it off into another cask, and it will also be a very useful precaution, to put into the last mentioned vessel about a quarter of a peck of wheat, prepared as I have already directed: this will give it new life and spirits, and make it keep better, and drink much pleasanter.

I have sometimes also used another method to cure tart cyder; but it has not always succeeded with me; why, I cannot say, as some people, who live not many miles from me, have great dependence on it.

Something may depend on their soil differing from mine, though this may, to some of your readers, seem to have a very remote analogy to the case in hand. The remedy is, to break half a dozen new laid eggs, and beat them up, shells and all, till they are brought to a frothy oil: this is put into the bung hole of a hoghead, and, as I am credibly informed, sometimes proves a very efficacious remedy: it has succeeded with me, but not so often as to induce me to depend much upon it; I mention it, however, as it may prove of more efficacy with others than it has with me.

An industrious planter will, by the constancy of his observations and remarks, always have it in his power to cure his own liquor by receipts of his own discovering; and for this purpose I would recommend, that he be continually making experiments, and that whatever trials he makes, be in various modes and proportions; for the remedy that may be of no service in one form, may possibly be very efficacious when altered with judgment, which judgment can only be acquired by experience and observation.

It is to be noticed, that, if the cyder is acid, and at the same time clear, it is in a very dangerous state, being but rarely recovered: therefore, in general, when this is the case, the cure is scarcely worth attempting.

I have often used wheat for the recovery of my cyder in other forms, sometimes putting about half a peck, unground, in a hoghead for it to feed on; at other times I have made dough of coarse meal, with bran in it, adding some leaven, using no salt, and putting warm cyder, or white wine, instead of water, into the mixture: this dough I make into lumps about as large as my fist, and thrust them into the bung-hole of the hoghead, the quantity being about half a peck of the meal to a hoghead.

Many mix different kinds of spice with their liquor, particularly ginger, which they think of great service; but I never use it now, seldom having found any great effect resulting

from it, and being of opinion that it renders the cyder more unwholsome than it can possibly in its own nature be; for, though the ginger may not make any very sensible alteration in the immediate taste of the liquor, it must, I think strongly impregnate it with its fiery particles, and thereby greatly irritate the mass of blood, and inflame the lungs of such as drink any quantities of liquor wherein it has been infused: others, however, may differ in opinion from me: I know, indeed, many that do so; therefore I only declare my opinion.

There is one custom, much practised by cyder makers, which I cannot help detelling, that is, putting animal flesh in their liquors: some put several pounds of veal into a hoghead; others, pork, beef, and mutton; and sorry I am to have it to say, I have known some put horse-flesh to chuse, thinking it preferable to the flesh of any other animal. What can be the reason for such their opinion, I am quite at a loss to learn, being sensible, that there is a very material difference betwixt spirits extracted from animal substances, and what vegetables yield.

They do this, I believe, by prescription, thinking that what their fathers practised cannot be wrong.

I, for my own particular part, am not so infatuated by prejudice; my reason disapproves of the practice, therefore I reject it.

You will, I hope, Gentlemen, excuse the manner in which these detached sentiments, on a particular subject, are put together: I am an old man, and therefore do not love much trouble; otherwise, as on a second reading I did not, myself, approve of my manner, I should have clothed them a-new. I comfort myself, however, with the reflection, that your readers will be more attentive to the matter than the manner: my meaning is good, and that is all the merit I presume to arrogate to myself.

With a perfect approbation of the many valuable pieces contained in your collection, I shall now conclude, that I am, with great truth,

Gentlemen,  
An Admirer, Reader, and Purchaser of your Work,  
AN OLD PLANTER.

Hereford, March 2d, 1764.

*Mr. Bakewell's Rules for choosing Cattle. From Young's Annals of Agriculture. Vol. VI.*

**M**R. BAKEWELL, of Dishley, in Leicestershire, is the most celebrated Grazier in England; and perhaps no man

man ever made greater improvements in breeding cattle. An instance of this is recorded in Mr. Young's *Annals of Agriculture*, Vol. VIII. p. 492; where we are told that in the year 1787, Mr. Bakewell let three Rams, for the season, for *two hundred guineas*; and that he has been offered a *thousand guineas* for 20 ewes, and refused it. "This," as Mr. Young justly observes, "is carrying stock to such a perfection as no idea was ever before entertained of." The following rules and principles are those by which Mr. Bakewell so much improved his stock:

#### GENERAL PRINCIPLE.

"The leading idea, which has governed all his exertions, is to procure that breed which in a given food will give the most profitable meat—that in which the proportion of the useful meat to the quantity of offal is the greatest:—also in which the proportion of the best to the inferior joints is likewise the greatest.

"The propriety of the rule is obvious, and at one stroke cuts off many common notions that will not stand the test of that critical examination, which may on this principle be instituted. Thus the short leg, when the result of a great heaviness in the belly and the shoulders, indicates no more than the weight of the beast being in the worst joints. Some are at present fond of a great dewlap with Virgil

*Et crurum tenuis a mento palæaria pendens.*

But, as it is mere offal, yet undoubtedly demands that nourishment which might go to a better place, it is to be rejected as an absurdity and classed with the folly of a Norfolk sheep-matter, who admires a ram's horn three feet long and nine inches in circumference. For the same reason, a thick hide, a great head, or, in a word, any part of the animal being heavier than ordinary, except those joints which are the most valuable, are to be considered as breeding offal, not meat; and on the contrary, those best joints cannot be too heavy, under which idea Mr. Bakewell has bred some beasts to be so exceedingly fat on the rump as to appear—monstrous to the eye. Of this sort was the ox shewed at Mr. Tattersal's, and he has many hulls and cows of the same kind. The experiment is very remarkable, and shews to what perfection skill and attention will carry breeding.

#### Points of a Beast.

"On this plan, the points to attend to in a beast, are those where the valuable joints lie, the rump, the hip, the back, the ribs, and after these the flank—that is to say, the backward upper quarters; but the belly, shoulder, neck, legs, and head

\* Mr. B. when in Suffolk, measured the horns of one of Mr. Macre's rams of these dimensions.

head should be light, for if a beast has a disposition to fatten, or be heavy, in these it will be found a deduction from the more valuable points. It has been said, but improperly, that a barrel on four short sticks would represent the true form; but that shape swells at the top and bottom, whereas the back of a beast should be square, straight, and flat, or, if any rising it should be from a disposition to fatten and swell about the rump and hip bones. And the belly should likewise be quite strait, for if it swells, it shews weight in a bad point. Again, the shortness of the leg is what Mr. Bakewell calls a non-essential; under which title he classes all those points, which fashion, custom, or prejudice have at different times, and in different places, called attention to, but improperly. Head, neck, horn, bone, leg, skin,\* colour,† &c. have all been considered as important; but, in fact, none of them are so, for let every one of these circumstances be condemned, in a beast, he should, notwithstanding that, prefer him, if his carcass was well made, and shewed a disposition to fatten in the valuable points.

“ This doctrine is new, and of very great importance to graziers; as far as reason will permit one to judge the principles on which it is founded are just, and whoever has the pleasure of viewing Mr. Bakewell's cattle, will see them powerfully exemplified in actual practice, with a success that cannot permit many to remain infidels.

*Feeling.*

“ In order to judge whether a beast has the right disposition to fatten, Mr. Bakewell examines by feeling. His friend Mr. Culley, of Fenton, near Wooler, in Northumberland, who has had an infinite number of beasts, both fat and lean, go through his hands, agrees entirely with him in this circumstance, and when in Norfolk and Suffolk with him could scarcely believe his ears, when he was told, that lean bullocks and sheep were always bought there by the eye only.

“ So absolutely necessary is the hand in choosing either, that they both agreed that if they must trust to the eye in the light, or to the hand in the dark, they would not hesitate a moment in preferring the latter. The form of the bone in sheep is quite hidden; it is the hand only that can tell whether the back is flat, and broad and free from ridge in the back-bone, or examine correctly if the other points are as they should be.

“ In a bullock the situation of the bone is seen, but there are other circumstances which are essential, that the eye quite escapes.

\* Thick hides however are generally to be esteemed worse thriving beasts than thin.

† Pale colours, as white, yellow, &c. Mr. Bakewell thinks are indications of finer meat than the darker ones.

escapes. The disposition to fatten is discovered only by feeling; and in this habit in the grazer goes very far. Mr. Bakewell and Mr. Cullley when in Suffolk, endeavoured to make me understand this object, by feeling many beasts that were quite lean, and presently convinced me that there was a manifest difference in them. The hip bone should be covered with something under the skin that feels soft and oily; the same along below the back bone, and on the ribs; with a good flank. In beasts that will not thrive well there is nothing of this softness to be perceived, but the hide is tight and hard. A distinction is however to be made between a certain frothy looseness, which is different from that soft mellow, if I may venture the expression, which indicates the true disposition to fatten. I can give by words, but an imperfect idea of it, but any person that examines many beasts in a fair, will, by marking some difference, presently be convinced; that it really exists in the degree mentioned; and very great and extensive experience has convinced the graziers in various parts of the kingdom, that these points decide the future thriving of the beasts, and with so few exceptions, that the rule may be considered as general.

#### Sheep.

"The points in which to examine a sheep, and the general form of his carcass, are the same as in an ox. The flatness and breadth of back, a spreading barrel carcass, with flat bellies, and by no means curved and hanging; with such a disposition to fatten, as indicated in the bulls and cows.

"A very great error has been spread by some persons, which seem to connect Mr. Bakewell's breed with the Lincoln, but in fact, it is not more distinct from the Norfolk. The Lincoln has been entirely spoiled by breeding for quantity of wool only; which, however might answer when wool was at a high price, could not but be attended with bad consequences when prices fell.

"The non-essential points in sheep, are the short legs so much valued in some countries, the white faces of Wiltshire, the black faces and legs of Norfolk, the horns of various sorts that are so much valued, &c. &c. Carcass all, and a disposition to fatten on the carcass, and perhaps to have the least tallow on the inside.

"A considerable illustration will be thrown on this doctrine, by some observations Mr. Bakewell made in Norfolk and Suffolk, where he examined all the best flocks; because there can scarcely be two animals of the same species more different, than a Dishley and a Norfolk sheep. If the Norfolks are good sheep, Mr. Bakewell is in a cruel error, and all his principles are worthless. The characteristics are these

"The



"The back is narrow, instead of being broad; and ridged in the middle, instead of being flat. There is no disposition to be fat in the rump, back, or ribs; but they die better than they feel, as they tallow well, which is a fault when gained, as in this breed it is at the expence of the fat which should be better placed. When killed in hot weather, it will not keep so long by twenty-four hours, as the meat of the South Down breed. The flavour of the mutton is excellent, a circumstance not uncommon in lean venison.

"The gravy of the meat is unusually plentiful, and remarkably high coloured."

*An Account of a new and cheap Method of preparing Pot Ashes.  
From Duncan's Medical Commentaries. Vol. VII.*

**T**HE Agriculture Society at Manchester have long recommended the making of reservoirs, for the water which flows from dunghills in farm-yards.

This water is strongly impregnated with the salts, and putrid matter of the dunghill; and by stagnation, it acquires a much greater degree of putrescency, and probably becomes proportionably more replete with salts. When thus collected and improved, it is pumped into a hoghead, which being drawn upon a sledge or small cart, is conveyed into the meadows, for the purpose of sprinkling them with this rich manure. This important improvement in rural economy, I apprehend, has not been extended much beyond the district of our Society; and it seems to be unknown to one of the latest, and most intelligent writers on husbandry. For Lord Kaimes, in a recent work on this subject, of which he has favoured me with a copy, has not even mentioned it.

But these reservoirs may be applied to a purpose still more subservient to public utility, than the above described.

Josiah Buck, Esq; a gentleman, who carries on an extensive manufactory, and bleaches his own yarn, about six months ago, was induced, by a happy turn of thought, to try whether the dunghill water might not be converted into pot-ashes. He accordingly evaporated a large quantity of it, and burnt the residuum in an oven; the product of which so perfectly answered his expectations, that he has ever since continued to prepare these ashes, and to employ them in the process of bucking. A stranger to that narrowness of spirit, which seeks the concealment of a lucrative discovery he is desirous that it should be communicated to the Royal Society, and has furnished

nished me we with the following account, together with the plan annexed.

" No. 1. The dunghill.

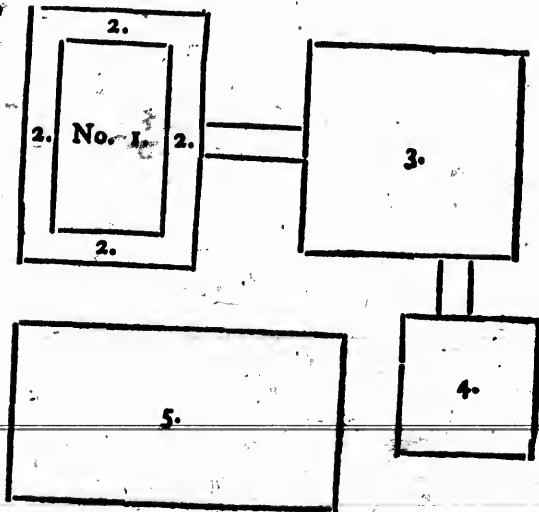
" No. 2. A fough, or drain, round the bottom of the dunghill.

" No. 3. A hole, or pit to receive the muck-water from No. 1.

" No. 4. A well, to receive the muck-water from the pit, wherein a pump is fixed to convey it to the pan, No. 5. in which it is boiled to the consistence of treacle, and afterwards burned in an oven. The pan, No. 5, is formed at the bottom of iron plates; and turned up a little round the edges, to which deal planks are screwed, so as to make it about twenty inches in depth.

" The quantity of muck-water used, was twenty-four wine pipes full; which employed a man and two horses two days, to cart it from the pump to the pan wherein it was boiled: But this expence I shall now save; as I shall lay a fough of brick, which will convey it from the pump to the boiler. The coals used to boil and burn it, were one hundred and twenty baskets; and I suppose each basket weighs six score pounds, or upwards. One man was occupied three weeks in boiling and burning. The quantity of ashes made, was 9 cwt. 1 qr. 12 lb; well worth, at the present price of ashes here, two guineas per hundred.

" 9 cwt.



" 9 cwt. 1 qr. 12 lb. at 42s. per cwt.	£.19	13	0
" A man and two horses two days, at 6s.	£.0	12	0
" 120 baskets of coals, at 5s. per basket,	2	10	0
" A man's wages for 3 weeks	1	7	0
	£.4	9	0
	£.15	4	0

" The gain therefore amounts to £.15 4 0, deducting only a trifle for the wear of the pan and oven."

POSTSCRIPT.

It has been suggested to me, that the foregoing discovery has no claim to the patronage of the Agriculture Society, because in this manufacturing county it may eventually tend to check the cultivation of land, by robbing it of one species of manure. But I conceive the operation of it, will be entirely the reverse: For it will promote the collection of every putrescent article, and thus augment the farmers dunghill, at the same time that it excites a more universal attention to the preservation of muck water; the reservoirs for which are yet few, and have been made chiefly by those who follow husbandry for amusement, and not as an occupation.

*Directions for raising Flax. Published by Order of the Commissioners and Trustees for Fisheries, Manufactures, and Improvements, in Scotland; and enriched with Notes suited to the Soil and Climate of Pennsylvania, by a Gentleman long in the Practice of raising Flax here. From the American Museum, Vol. II. Page 478.*

*Choice of Soil, and preparing the Ground for Flax.*

**A** SKILFUL flax-raiser always prefers a free open deep loam, and grounds that produced the preceding year a good crop of turneps, cabbage, potatoes, barley or broad clover; or has been formerly laid down rich, and kept some years in pasture.

A clay-soil, the second or third crop after being limed,\* will answer well for flax; as well as soils of a lighter quality; provided

\* Pennsylvania farmers say that land manured with some lime will not produce good flax.

provided it be brought to a proper mould, by tilling after harvest to expose it to the winter-frosts; and by repeated ploughings in the spring to make the ground fine. A little old stable-dung, or that of pigeons, or sheep, or asses, may be spread upon the ground immediately before sowing.

Ground enriched with shell or other marls, will answer well for flax, if the marl has been mixed with the soil for some time.

In dry soils, the broader and more level the ridges are laid, so much the better; as, by that means, the natural moisture will be longer retained, and the crop rendered more equal and uniform; which uniformity is of great advantage to crops of flax.

All new grounds, or such as have lain long in grass or pasture, produce clean crops of strong flax; but ought to be ploughed as shallow, and the furrow laid as flat as possible.\*

Flax-seed ought never to be sown on grounds either too wet or dry; but on such as retain a natural moisture: and such grounds, as are inclined to weeds, ought to be avoided, unless prepared by a careful summer fallow, or by crops of turneps, cabbage, or potatoes.

Before sowing, the bulky clods should be broken, or carried off the ground; and stones, quickens, and every other thing that may hinder the growth of the flax, should be removed.

*Choice of Linseed.*

The brighter in colour, and heavier the seed is,† so much the better: that which appears, when bruised, of a light or yellowish green, and fresh in the heart, oily, and smells and tastes sweet, may be depended upon.‡

Dutch seed, of the preceding year's growth, for the most part, answers best; but it seldom succeeds if kept another year. It ripens sooner than any other foreign seed. Philadelphia seed produces fine lint and few bolls, and answers well in cold wet soils.

*Of sowing Linseed.*

The quantity of the linseed sown should be proportioned to the condition of the soil; for if the ground be in good heart, and the seed sown thick, the crop will be in danger of falling, before it is ready for pulling. Nearly three bushels Winchester measure, of Dutch or Riga seed, are generally sufficient for one Scot's acre;|| and about two bushels and a half

O 2

\* After ploughing, a heavy roller should be used to press the seed smooth and close to the ground. This will make the grass rot the sooner.

† The Connecticut seed is better than the Pennsylvania.

‡ Seed should be repeatedly passed through the screen, that there may not be left among it a single vine seed, or any light defective flax seed.

|| Four Scots acres are equal to five English.

half of Philadelphia seed, which, being the smallest grained, goes the farthest.

The time for sowing linseed is from the middle of March to the end of April, as the ground and season answer.

It ought always to be sown on a dry bed. And if the soil be light, it should be rolled after harrowing; especially if grass seeds are sown along with it.

#### *Of weeding Flax.*

It ought to be weeded when the crop is about four inches long. If longer deferred, the weeders will so much break and crook the stalks, that they will never perhaps recover their straightness again; and when the flax grows crooked, it is more liable to be hurt in the rippling and swingling†.

Quickens should not be pulled in weeding; for, being strongly rooted, the pulling would lay open, and endanger the roots of the lint.

If there is an appearance of a settled drought, it is better to defer the weeding, than by that operation to expose the tender roots of the flax to the drought.

As soon as the weeds are pulled, they ought to be carried off the field, and not laid in the furrows; where they often take root again, and at any rate obstruct the growth of the flax in these parts.

As young and unskilful persons frequently pull up and spoil the flax, they ought to be mixed with those of more experience. And all ought to take care not to destroy the flax with their shoes, or by resting too much on their elbows, when employed in this business.

#### *Of pulling Flax.*

If it is intended to save both the flax and the seed, the pulling should not begin till the stock becomes yellow, almost all the leaves fallen, and the bolls turned so sharp that they will stick to the finger when pressed upon their points; also one of the lower bolls, cut across the grain with a penknife, appears full of seed, well formed, and firm. But if the stalk is small, with few bolls upon it, which is a sign that the flax is fine, it ought to be pulled when the stalk first begins to grow yellow, when only the undermost leaves fall, before the bloom is quite over, before the bolls turn sharp pointed, and when one of the bolls, cut across the seed, appears soft and watry. It is a rule with persons of skill to follow this last method, when they think

\* If sown on grass ground, ploughed, as the author directs, the harrow can not be used, even lengthways, because it will tear up the sods. A heavy brush is best.

† If the seed is pure, and sowed on grass ground, all this trouble and expense will be saved.

think that about eight hanks or more may be spun from the English pound.

When flax has fallen, such as lies ought to be immediately pulled, otherwise it will rot; and that being pulled, the rest of the crop will receive the more air, and be less apt to fall.

When parts of the same field grow unequally, so that some parts are ready for pulling before others, what is fit should be pulled, and the rest suffered to stand till ready.

The flax raiser ought to be at great pains to pull, and keep by itself, each different kind of lint; what is long and fine, by itself; what is long and coarse by itself; what is both short and fine, by itself; what is both short and coarse, by itself; and, in like manner, every other kind by itself: for if the different kinds are not thus kept separate, the flax will be much damaged in the watering, and the other succeeding operations.

While pulling and sorting the flax, the weeds ought to be picked out; otherwise they will hurt the flax in the operations of watering and dressing; and what is commonly called undergrowth may be thrown away as useless.

Few persons that have seen flax pulled, are ignorant of the method of laying it in handfuls across each other, upon bands composed of some of the stalks. Laying the handfuls in this way, admits sufficient air, and keeps them separate and ready for the rippler.

*Management of the crop after pulling, and before rippling.*

If the flax is not of the finest kind, the cross-handfuls, after lying twenty-four hours as above described, should be turned upon the band; and then, after lying other twenty-four hours, should be bound up in sheaves, and stacked like corn, but not covered with head sheaves. If the weather is dry, in about a fortnight's time the seed will be sufficiently won for rippling, and may then be removed to the barn. But if the flax is fine, in about twelve hours after it is pulled, it should be put into stacks; and, if the weather continues dry, in two or three days more it may be rippled.

Keeping the flax unwatered till next spring, is attended with many bad consequences. For when too much dried, by long keeping, it is not so easily nor so safely watered; the quality of the flax becomes thereby harsher and coarser; it is subject to danger from vermin, and other accidents, during the winter; the water in spring, or beginning of summer, is not so soft and warm as in harvest, and near a year, by that practice, is lost, of the use of the lint.\*

\* If you wish to have very fine flax, pull when the stalks begin to turn yellow; and, before you put it into your pond to rot, chop off all the roots and branches.

*Of rippling Flax.*

The seed ought by all means to be separated from the flax before watering; for if put into the water along with the flax, it is apt to breed vermin, and discolour it; besides, even the weakest seeds and the husks make an excellent feed for horses and cattle; in particular, they are found to give a fine coat or skin to horses.

When the seed is to be won for sowing, it should be rippled within doors; for rain and damp will discolour, and render it unfit for sowing.

The handfuls for rippling should not be great, as that endangers the lint in going through the comb,

After rippling, the flax-raiser, will perceive, that he is able to assort each size and quality of the flax, more exactly than he could do before.

*Of winnowing the Seed.*

The bolls, after rippling, should be sifted through a wide riddle, to free them from the wreck of the flax, and if this riddling be done before the wind, to separate the bolls and seed from dust, so much the better. Then the bolls should be carried to a shillin-mill: but if there is no such mill in the neighbourhood, the seed must be threshed out with flails. After this operation, the whole should pass through fanners, and different sieves, to clean the seed as much as possible from broken husks, dust, weak seed, &c. Being thus cleaned, it should be carried to a free-aired loft, and spread thin, and often turned for some time, to prevent it from heating: and as the seed dries, it may be laid up thicker together, and seldom turned, till at last it is fit for the market or sowing.

*Management of the Flax, after rippling, and before watering.*

Rushes should be pulled and dried during the summer, for tying the handfuls of flax for the water.

They save flax, and answer well for this purpose, as they do not easily rot in the water; and may be dried again, and kept for the next year's use.

The flax, from the rippling comb, being properly sorted, as before mentioned, should be put up in small beets, never larger than a man can easily grasp with both his hands, and tied slack with a band of rushes. The flax that has stood long in the field, will be bent or crooked, and therefore must be carefully straightened with one's hands and knees, and laid even together in a mow, in a shade or barn.

The mow ought to be raised regularly one row above another until it rises to the lofting, or is pressed down with logs or boards, and a sufficient weight above them. In this situation

situation it should remain from twelve to twenty-four hours, according as the flax is dry. This compressing, and laying of the flax together, mellow's it also, and prepares it the better for the watering.

#### *Of watering Flax.*

A running stream wastes the lint, makes it white, and frequently carries it away. Loughs, by the great quantity and motion of the water, waste the flax also, and whiten it, though not so much as running streams. Both rivers and loughs, water the flax quicker than canals.

But all flax ought to be watered in canals, which should, if possible, be dug in clay ground, as that soil retains the water best: but if a firm retentive soil cannot be found, the bottom or sides of the canal, or both the bottom and sides may be lined with clay; or instead of lining the sides with clay, which might fall down, a ditch may be dug on each side of the canal, and filled with clay, which will prevent both extraneous water from entering, and the water from within from running off.

A canal of about sixty feet long, seven feet broad, and two feet and a half deep, will generally water the growth of an acre of flax. If the canal be deeper, the water near the bottom will be too cold; consequently the flax will not be so soon, nor so equally watered. But if the ground be loose, and subject to lose water, then the canal may be filled to the depth of three feet, but deeper is not adviseable.\*

The canal ought, if possible, to be filled with fresh soft water from a river or brook, two or three weeks before the flax is put in, and exposed all that time to the heat of the sun. The greater way the river or brook has run, the softer, and therefore the better will the water be. Springs, or short runs from hills, are too cold, unless the water be allowed to stand long in the canal. Water from coal or iron is very bad for flax. A little of the powder of galls thrown into a glass of water, will immediately discover if it comes from iron, by turning it to a dark colour, more or less tinged in proportion to the quantity of that mineral it contains.

The canal ought not to be under any shade; as this, besides preventing the sun from softening the water, would make part of the canal cooler than other parts, and by that means water the flax unequally.

The flax-raiser may observe, when the water is brought to a proper heat, small plants rising in it, numbers of small insects and reptiles generating, and bubbles of air rising on the surface.

\* In this climate, a pond or canal, filled with water from the coldest spring, will in twenty-four hours be sufficiently warm to receive flax.



surface. If no such signs appear, the water must not be warm enough, or is otherwise unfit for flax.

Moss-holes, when not much deeper than before described, answer well for watering flax.

The sooner flax is watered in the same season in which it is pulled, the better; and none should be put into the water after the middle of September.\*

The beets of flax, before described, should be laid into the canal, in rows across it; the first row of beets with their crop-ends leaning upon the end of the canal, about a foot above the bottom, and the root ends sloping downwards; the crop-ends of the second row overlapping the band of the first row; and so on till the canal be filled. Vermin are fondest of the tender crop-end; which, one might think, should for that reason be put downmost; but, as that end requires the warmest water, therefore, upon the whole, it is thought most advisable to keep it uppermost.

The whole flax in the canal ought to be carefully covered from the sun, and kept under water with a weight of sods; the grassy side next the flax, to keep it clean. If the flax is not covered, although it be under water, the sun will discolour it. But it ought by no means to be so much pressed down, as to prevent the water from penetrating freely through every part of it. When sods cannot be easily procured, rushes, sedges, ferns, refuse of flax, or any weeds that will not discolour the lint, may be laid immediately above the flax; and the whole pressed down with slime, stones or any other weighty body.

When the flax is sufficiently watered, it feels soft to the grip, and the harle parts easily with the boon or shew, which last is then become brittle and looks whitish. Take some beets out of the different parts of the canal; and out of the heart of these beets, take a few of the smallest stalks. Break these stalks in different parts, about four inches distant; and if the boon breaks freely, and can be drawn easily from the flax, without any of the harle adhering, then it may be depended upon that the stalk is sufficiently watered. When these resigns are found, the flax should be taken out of the canal, beet after beet, and each gently rinsed in the water, to cleanse it from the filth that has gathered about it: and as the lint is then very tender, and the beet slackly tied, it must be carefully and gently handled.

Great care ought to be taken, that no part is over-done; and as the coarcest is soonest watered, if different kinds are mixed

\* This direction will not hold good in Pennsylvania, because our weather after that time and even to the middle of October, is warm enough to water cot flax, or hemp.

mixed together, one part will be rotted, before the rest is sufficiently watered.

When lint, taken out of the canal, is found not sufficiently watered it may be laid in a heap, for twelve, eighteen, or twenty-four hours, which will have the same effect with more watering; but this operation is nice, and may prove dangerous in unskilful hands.

After the flax is taken out of the canal, fresh lint should not be put a second time into it, until the former water is run off, and the canal cleaned, and supplied with fresh water; it being found by experience, that the insects, bred during the first watering, will destroy the second filling, if the canal be not emptied, cleaned, and again filled with fresh water. <sup>o</sup>

o Another mode of watering flax.

o *o* Raise, by making two dams across a small stream, a head of three or four feet. In your lower dam, place a joint of a pump low enough to discharge all the water out of your pond.

In your upper dam, place another joint, not so low as the former; with plugs stop both joints tight; then wall in a piece of ground between your dams, on all sides, and dig out the earth within the wall, three or four feet deep, and throw the earth over the wall. Near the bottom of your hole, thus made, put three or four sleepers, the ends of which must be introduced into your wall, to prevent their rising, when the pond is charged. Across these sleepers, nail some strips of boards, so close, that the flax may rest upon them, without touching the ground. By means of these dams, the course of your stream will be diverted to one or both sides of your pond, consequently your water in it will not be interrupted by rains. On one side of your pond, the most convenient to haul from, place an inclining table, made of smooth boards, on which your flax is to be placed to drain, when taken out of the rotting pond.

All things being thus prepared, charge your pond, by drawing your upper plug. When charged, stop it again; let the water have twenty-four hours to warm; then form in the centre of your pond, a square island of flax, twelve or fourteen inches thick, thus;



a. The spring. b. The table.

*Of drying Flax after Watering.*

In this variable climate, the spreading of flax upon the ground, as formerly practised, after watering, is now disapproved of, as losing a great deal of time, exposing it to great danger from high winds, and rotting by rains, and the grass growing through it. After grazing in the common method, parts of the crop are always found very differently prepared, and of different colours, because it is impossible to have it all equally exposed to the sun and weather, without frequent turning: which in this country is a difficult and expensive operation, and has been found very hazardous on account of high winds.

When the flax is taken out of the water, the beets are to be laid on the side of the canal to drain; and at this time the flax being very tender, it must be gently handled. When stiff enough to bear standing upon end, the beets are to be lifted, the bands drawn up near the crop end, and each beet set upon its root end, spread open to the wind, as is the practice with wet sheaves of corn. Women, boys, and girls, should be closely employed to spread open the beets, and expose the whole as much as possible to the sun and wind until the flax be thoroughly dry.

If rain should fall while the beets are lying in heaps upon the side of the canal to drain, it will be in danger of heating, to prevent which they must be laid asunder, to give them the more air, until dry weather happens.

*Letter*

Bind the several layers together by pieces of boards or rails; place on them some clean smooth pebbles, clear of grit, sufficient to sink the flax under the surface. When the fermentation begins, which will depend on the warmth of the weather, the island will rise; then more weight must be put on, to keep it under water. When the fermentation is over, the flax will sink to the bottom, then it is time to draw it out, and spread it on the ground; but before you do this, wash it clean, by alternately draining your pond by means of your lower joint, and charging it with clean water by your upper. Flax, in very soft water, in very warm weather, will rot sufficiently in four days; sometimes it will require eight days, and sometimes twelve. The sinking is the sole criterion by which you are to be directed. In the summer, when the sun is very powerful, it will be necessary to put two small troughs on the top of your dam, one on the upper corner, the other on the opposite diagonal corner; this gentle running of water on the surface, will prevent the flax from rotting sooner at the top than at the bottom.

In the lower box of the flax brake, there should be a spring fixed, to prevent a jar of the arm. The spring may be made of hickory, and, when sunk in the block, should be secured by two pieces of iron.

*Letter on the Use of Plaster of Paris, as a Manure. From George Logan, Esq; to the Philadelphia County Society for the Promotion of Agriculture and Domestic Manufactures. From the American Museum. Vol. VI. Page 399.*

GENTLEMEN,

**H**AVING for four years past, made use of plaster of Paris, or gypsum, as a manure upon variety of soils, and under different circumstances—I beg leave to lay before you the result of my experiments, together with some observations respecting the nature of this fossil. I am the more anxious to comply with my duty to the society in this respect, because many of our fellow-citizens are losing the great advantage to be derived from the use of this manure; entertaining an opinion, that it does not, in itself, contain any nutriment to plants, but that it acts merely as a stimulus to the soil, by which, although vegetation is for a short time rapidly promoted, yet the ground becomes exhausted, and is left a dead inert mass.

1st. In the year 1785. I sowed three acres of a light silinglass soil, containing a little clay, with barley and clover. In the month of April, the following year, I divided the field into three parts, and strewed six bushels of French gypsum on No. 1; the same quantity of the American gypsum, brought from the Bay of Fundy, on No. 2; and left the intermediate space No. 3, without any. On cutting the first crop, that year, little difference could be observed; the second crop, produced double the quantity of grass, where the gypsum had been put; and the succeeding year, the difference was still greater in favour of this manure. Early in October, 1787, the clover lay was ploughed once, about four inches deep, was sowed with rye, and in that rough state was harrowed. The rye was of a superior quality and double the quantity on No. 1 and 2, of that on No. 3. After harvest, the ryestubble was ploughed, and sowed with buck-wheat, when a striking difference was still observable in favour of the gypsum, and which continues in the present crop of Indian corn.

2d. In April, 1787, I sowed three acres of potatoe ground (a light loam) with barley and clover. Just as the barley was above ground, some gypsum was strewed diagonally across the field, about eight feet wide. Little or no difference could be observed in the barley; but in the month of September following, there was a striking difference in the clover, in favour of the manure, which would have afforded a good crop of hay, whilst the remainder of the field was but indifferent. I have frequently put gypsum upon grain; without observing any immediate difference, in the appearance of the crops.

3d. In April, 1786, six acres of a poor singlass Soil, situated on Germantown hill, were sowed with oats, the ground having been manured for twenty years; it produced a crop not paying expenses. In April, 1787, one half of the field was covered with the gypsum, six bushels to the acre. The latter end of the same summer, that part, on which the manure had been put, produced good pasture of blue grass and white clover, whilst the remainder afforded little but a few scattered weeds. In October, the field was ploughed once, and sowed with rye; at harvest, the former produced ten bushels to the acre, the latter not above five.

4th. A field of 15 Acres, a light loam, was, in April, 1784, sowed with barley and clover, the produce only twenty bushels to the acre, the ground not having been sufficiently manured. In 1785, it produced a good first, and a tolerable second crop of clover. In 1786, the first crop but tolerable; the second very indifferent and therefore pastured. In the spring 1787, I wished to try if gypsum would not renew the clover. In the month of April, the whole field was covered with gypsum, six bushels to the acre, except the width of twenty feet, through the middle of the field. St. John's wort, mullain, and other weeds, had taken such possession of the ground, that, although the manure produced a great luxuriance of grass, yet, being full of weeds, it did not answer for hay; and therefore was pastured until October 1788: the whole was then ploughed 8 inches deep, with a strong three horse Dutch Plough: last April, it was well harrowed, and cross ploughed, four inches deep, with a light two-horse plough, leaving the sod at the bottom. The field was sowed with spring barley, at harvest, the difference of the crop was astonishingly great in favour of the part where the gypsum had been put, two years before. This ground is now under wheat and winter barley, which have a promising appearance: the soil, being turned up and mixed with the soil, affords nourishment to the present crop.

5th. I put a quantity of gypsum, three years ago, on several small patches of a tough sod; it produced a difference in the strength of vegetation, which is still observable.

From the above recited experiments it appears—  
That there is no difference between the European and American gypsum.

That gypsum is not an immediate manure to grass, and afterwards in an equal degree to grain.

3d. That one dressing will continue in force several succeeding crops.

Gypsum not producing any remarkably beneficial effects, when used as a top dressing to grain, may arise from two causes; first, from the small quantity made use of, which is lost in the rough

rough ground; and secondly, from the short time of its application. It has been found of advantage to Indian corn, but in this case, it is absolutely necessary to apply it immediately to the corn, as it appears above ground, and that in a considerable quantity—I have put it on grass ground every month in the year, except, during the severity of winter, and have found, that early in April is preferable to any other season; at which time, the grass just shooting, the small particles of the gypsum are detained about the roots, and prevented from washing away. On stiff clay soils, it will produce an increase of vegetation, but not sufficient to pay the expense of the manure.

*An approved Method of preserving the fine Flavour of Butter, and of preventing its growing rancid, communicated to the "Burlington Society for the promoting Agriculture and Domestic Manufactures," by their President, and ordered to be published. From the American Museum. Vol. VIII. Page 172.*

**T**O a peck of fine salt add one ounce of crude sal ammoniac, and two ounces of saltpetre, both finely powdered: mix them very well with the fine salt: with this salt, work your butter, until the butter-milk be entirely extracted. Then pack it in wooden firkins, salting it with the same mixed salt, to such a degree as to be palatable, when eaten with bread, and no salter. The mixture is stronger than fine salt: of consequence something less is required.

By order of the Society,  
W. COXE; Jun. Sec'ry.

*European Method of cultivating Hops. From the American Museum. Vol. V. Page 165.*

**N**EW land is found to succeed better with hops, than old: and, on this principle, they are very cautious in their plantations in Kent, and look forward for the after produce. When they make a new hop ground, they plant it with apple trees at a large distance asunder, and with cherry trees between; by this means, when the hops have grown ten years, which they judge as much as they will do well, they place their account in the cherry trees, which bear large crops: these

these they gather for about thirty years, and then they cut them up, and depend upon their apple trees only, which they find very large and strong by that time.

The dry stalks of hops should be burnt on the ground in winter, covering them with a little fresh earth as they burn. This makes together an excellent compost to form the hills of. The land must be dug or ploughed well, and laid very even; and then the places for the hills marked out by a line, and a stick put in every place where one is to be. A thousand hills may be made in an acre of ground, and six or seven plants set on every hill. From six to nine feet should be allowed between every hill, and the ground in the hills should be better and richer than the common earth. Some plant hops in March and April, but the most experienced people prefer the month of October, because they will then strike firm roots, and be strong and vigorous against spring. The largest plants are to be chosen, and it is best to procure them from some rich ground, where the hills have been laid high: they should be about eight or ten inches long, and have three or four joints or buds each; the holes for planting them are to be dug eight or ten inches deep, and about a foot over and in each of these holes four plants are to be set, one in each corner: they may be covered an inch deep over the top, if planted in October; but in spring, when they have shot from the joints, then they must not be buried; after this the ground must be carefully kept clear of weeds.

#### *Dressing.*

This is preparing the ground in winter and spring for the making a good summer crop. In doing this, the hills, upon which the plants stand, must be all pulled down, and undermined on every side, till the spade comes near the principal root; then shake off, or remove with the hand, the loose mould from the upper or loose roots, that you may see where the new roots grow out of the old sets. The old sets are to be carefully preserved, but the other roots may be cut away. Whatever time the hills are pulled down, the roots must not be cut till March. When the young hops are dressed for the first time, all the roots are to be cut away that grew the year before, and the sets are to be cut off within one inch of the same, and every year after, they must be cut as close as may be to the old roots; but to a weak hop, some of the shoots are to be left at the dressing. Those roots of the plant, which grow downwards, are never to be injured, but only those which run horizontally are to be cut. The old roots and the young ones may be easily distinguished, as the old ones are always red, and the young white. If there are, by accident, any wild hops got among the rest, the places where they grow are to be marked

marked with sticks, or otherwise, at the time of their being gathered : and after this, at the time of dressing the ground, that whole hill is to be destroyed, and a new one made with new plants in the room of it. When the roots are cut and dressed, the rich compost is to be put to them, and the hills must not be made too high at first, lest they hinder the young shoots.

*Gathering and drying.*

Hops blow in the latter end of July ; in the beginning of August, they bell, and they are sometimes ripe at the beginning of September, sometimes later. When they begin to change colour, are easily pulled to pieces, and their seeds look brown within them, they are ripe, and they are then to be gathered as quick as possible, for the least blast of wind will hurt them at this time. The manner of gathering hops, is to take down four hills standing together in the midst of the garden, and to cut the roots even with the ground ; then lay the ground level ; and when it is swept clean, it makes a floor, on which the hops may be laid and picked. The hop plants are first unwound from the poles, and then the people sit round and pick off the hops into baskets. Care should be taken to dry the hops as fast as they are picked ; for, in lying undried, they are apt to heat, and change colour very quickly. If the quantity picked be so large that the kiln, in which they are to be dried, is overstocked, they must be spread thin upon a floor, and they will keep two or three days in that manner, without any harm. Indeed, when the quantity is but small, there is no need of having recourse to the kiln at all ; for they will be much better than any other way, by being laid thin upon a floor, and often turned. The drying of hops is the most material part of their manufacture : for if they be ill dried, they lose all their agreeable flavour ; and great caution should be used, that they be all equally dried.

*Bagging.*

A term used by farmers, who cultivate hops, for the last thing they have to do with them, in order to bring them to market ; that is, the putting them up in bags of coarse cloth, for carriage. When the hops have been picked and dried on the oost, or tin floor, they are so brittle that they would break to pieces, and be spoiled, if they were immediately put up ; they are therefore to lie together three weeks, or thereabouts, that they may become tough ; if they are covered from the air by blankets in the heap, they may be bagged much sooner than if left open. The manner of bagging them is this. A hole is made in an upper floor, so large that a man may easily go up and down in it ; then a hoop is fitted to the mouth of the bag, and so firmly sewed on, that it cannot be  
torn



torn off; the bag is then let down through the hole; the hoop remaining above, prevents it from being quite pulled through, as it is larger than the hole. A few hops are first to be thrown into the bag; and a person below is to take up a parcel of these in each corner of the bag, tying it with a packthread: this makes a sort of tassel, by which the bags are afterwards the easier managed and turned about. When this is done, one man must go down into the bag, and, while another casts in the hops, he must tread them down equally every way with his feet; and when the bag is in this manner filled, it is to be ripped from the hoop, and sewed up, leaving two tassels at the corners, as at the bottom. A bag of hops so prepared, may be kept for several years in a dry place.

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*To preserve Pumpkins, or Pumpkins, through the Winter and Spring. From the American Museum.*

**W**HEN taken from the vine, open them and throw away the soft contents which are found in their inside. Then cut them into small pieces, and dry them in the sun, or in an oven. Preserve them in a dry place. They may be either pounded or boiled before they are used. Prepared in this manner, they make a cheap and excellent food for cattle—horses and hogs. Many thousand pounds might be saved in grain to our farmers, and to our country, by the general use of this wholesome and nourishing food for domestic animals—They afford more nourishment than the potatoe or scarcity-root;—they are cultivated with less trouble, and yield a much larger increase from the same labour.

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*Directions for the manufacturing Sugar from the Maple Tree. From the American Museum.*

**I**F the sap is drawn into wooden vessels, care should be taken that they are made of such wood, as will not give the liquor a bad taste. Some maple sugar has a disagreeable taste, occasioned as I have been informed, by the sap having been put into trays made of the white walnut. If the moulds are made of wood, they also should be made of some kind of tree that will give no taste. The greatest part of the maple sugar I have seen, has too small a grain; which is owing to two causes; one is, the makers of it do not use lime or lye, or any thing else, to make it granulate; the other is, that they boil

boil the sugar too much—The quantity of lime necessary to answer the purpose, I cannot exactly ascertain; but I suppose a heaped spoonful of slacked lime, would be sufficient for about six gallons of sap. A judicious person after a few trials, would be able to fix the due proportion. It may, however, be proper to mention, that if the quantity of lime is too small, the sugar will not be sufficiently grained; if too much, it will give the sugar a reddish cast. I have before observed, that the sugar should not be boiled so much, as has been the common practice. That, from which runs about one-sixth of its weight in melasses, in twenty-four hours after it is put to drain, I think, has been boiled properly; perhaps, in three or four weeks afterwards, it will run the like quantity of melasses, making the whole of the running about one-third the weight of the green sugar. It is probable, that those who have been accustomed to high boiling, in order to get as much sugar as possible in the first process, will not approve of this method; but perhaps may be better reconciled to it, when they are informed, that if they boil this melasses or syrup with strong lime-water, one-third of the latter to two-thirds of the melasses, there is reason to expect it will make good sugar, although not equal to the first sort.

I shall now proceed to give some directions for the making of maple-sugar:—Let all the sap that has been collected in one day, be boiled the day following, lest it should ferment, in which case the sugar would be less in quantity, and worse in quality. To carry on the business to the greatest advantage, there should be three kettles of different dimensions. These kettles should be fixed in a row, the smallest at one end, the middle sized next, and the largest at the other end.—When there is a quantity of sap collected, put as much in the largest kettle as can be conveniently boiled in it; then throw in as much lime or lye as may be deemed necessary to make the liquor granulate. Keep a moderate fire for some time, and as the scum rises, take it off with a skimmer; after the liquor is pretty clear, increase the fire and boil it briskly, 'till so much is evaporated, as that which remains may be boiled in the middle kettle; into which the liquor must be strained through a blanket; under this kettle, keep a good fire, and take off the scum as it rises. As soon as the liquor is taken from the large, and put into the middle-kettle, fresh sap must be put into the former, and treated as before directed and so on, till all the sap is boiled.

When the liquor is sufficiently evaporated in the middle-kettle, to admit its being boiled in the smallest, it must be put

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 \* Some liquor should be left in the large kettle, if an iron one, otherwise there would be a danger of its splitting, upon putting in cold liquor.

put into the last, where it must be boiled, until it gets to a proper consistency to make sugar. When the liquor is taken from the middle kettle into the smallest, the former must be supplied, as is before directed, from the largest, with fresh sap. The liquor, in the small kettle, must be boiled briskly, until it gets pretty thick, when the fire should be lessened, to prevent its burning. When the liquor rises in the kettle, a piece of butter or fat, the size of a hazle-nut, may be thrown in; if this quantity does not make it boil flat, more should be added, until it answers the purpose, and this must be repeated as often as the liquor rises. When it is boiled enough, which may be known by the manner of its ropping between the thumb and finger, it must be put into a cooler or tub, when the small kettle must be supplied with liquor from the middle-sized one, that, with more from the largest, and the large one with fresh sap, as is before directed. When one-third of the sap, that has been collected, is boiled and put into the cooler, it must be stirred briskly about with a stirring stick (which may be made like a small paddle) until it grains, when it may be left (if the business has been well done) until another third of the liquor is boiled, and put into the cooler: it must be then moved about with the stirring stick, until it is well mixed together—when the remainder of the liquor is boiled and put into the cooler, it must again be moved about with the stirring stick, until the whole is well mixed, when it must be put into moulds; earthen would be best; but wooden moulds may be made to answer the purpose, by nailing or pinning four boards together, so shaped, as to make the mould one inch diameter at the bottom, and ten or twelve inches at the top; the length may be two feet, or two feet and an half—these moulds must be closely stopped at the small ends, with old coarse linen, or some such thing, and set up with something to stay them; the sugar must then be taken from the cooler, and poured into the moulds—next morning the stoppers must be taken out, and the moulds be put on troughs, or some vessel to drain their melasses. In the evening, the loaves must be pierced at the small ends, to make them run their syrup freely—this may be done by driving a wooden pin, (shaped like a marling spike) three or four inches up the loaf; after which they must be left to drain their melasses, which will be done in a shorter or longer time, according as the sugar has been boiled.

No part of the business requires greater attention than granulating or graining the sugar in the cooler, and afterwards frequently

\* Dip a stick into the liquor, apply the thumb to it, and take part of what adheres to the stick, then draw it two or three times between the thumb and finger.

frequently observing the state it is in—if too thick, it may be remedied, by boiling the remaining liquor lower, than that which was boiled before—if too thin, by stirring the cooler again, and boiling the remainder of the liquor higher, or more.

## A SUGAR-BOILER.

Philadelphia, August 21, 1789.

☞ The making of sugar is quite common and easy with a single kettle of any size.

*Of the great Benefit of Salt Marshes, for Horses and Cattle; and of substituting Salt itself, in their feed. From the Museum Rusticum. Vol. I. No. 19.*

IT has been observed, that horses and black cattle, thrive better, and get flesh and fat sooner, in salt marshes, than in fresh water meadows or upland pastures; yet I do not remember ever to have heard any good reason assigned for it.

Some will tell you that the air of the sea whets their appetites; that the pasture is rich and nourishing; and that the herbs produced by the lands near the sea are more conducive to the health of herbaceous animals, than such as grow on upland pastures, whether natural or artificial.

But may we not rather attribute the thriving of cattle on these marshes, to the saline particles \* with which the earth, as well as its produce, is, when near the sea, strongly impregnated? Perhaps even the dews have their portion of salt; but of this I have made no experiment, therefore mention it only as a probable conjecture; for as they fall soon after they are exhaled from the sea, without passing through the secretions necessary to separate their saline parts, why should not this be the case?

But to return to my first subject: I am fully of opinion, that the saline particles only, with which the grass is impregnated in the above mentioned marshes, cause cattle to thrive in them in the manner they are known to do. These salts purge away the foul humours which the beasts have contracted, either by idleness, or by being over-heated in labour; by which means they are better disposed to be nourished by the aliment they receive.

It may, perhaps, be objected, that if the grass of these marshes is apt to purge cattle, this very purging, by being long

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continued,

\* Perhaps the thriving condition of cattle on salt-marshes may be owing to the salts making them drowsy; for it is an observation of graziers, that when cattle drink plentifully they thrive apace.

continued, will be a means of preventing their growing fat. To this I answer, that the cattle take with their food every day nearly the same quantity of these purgative particles; but that the quantity of salt, which at their being first put into the marsh will have that effect, will cease producing it when they are, by custom, habituated to take a daily portion of it: this must be allowed, as we all know, that a few grains of rhubarb will operate as a cathartic to a person that is not accustomed to take it; yet it is as well known, that a man may take many grains daily, if he uses himself to it, without its being sensibly purgative to him.

It is not convenient to every one to send their cattle to a salt marsh: would it not, therefore, be happy, if we could substitute a method that would nearly answer the same purpose? I do not think this impossible: perhaps, if common sea-salt was to be laid in the fields for the horses to lick as often as they pleased, they would thrive much better: Were I to say I know it would have that effect, it would be no presumption.

Cattle are naturally fond of salt, and if left at their liberty, will take no more of it than what does them good. With this help, our fresh water meadows, and upland natural and artificial pastures, would yield us a greater profit, and of course be worth more both to the land-owner and farmer.

Some will not allow a thing to have merit, unless it is supported by what they call a proper authority; and they do not allow the experiments of a particular person to be sufficient. To satisfy such I can assure you, that in the inland parts of Switzerland, when their horses and cattle have endured the hardships of a long and severe winter, they turn them in spring loose into the mountains, laying salt here and there upon the rocks, for them to resort to when they please; and of this they are so fond, that when the farmers want to catch their horses, they take some salt in their hats, as we do oats in a sieve, to allure them.

Experience has long convinced them, that the salt thus laid in their way answers every good purpose: Their cattle are more healthy in general than ours are in England; and almost to this alone do they attribute it.

In the provinces of Munster and Connaught, in Ireland, they very frequently lay salt on slates, for the benefit of their horses when at grass: This, they find, does the cattle great service; and in this we should imitate them, and not be too proud

\* This method of laying salt in the way of cattle may be, perhaps, to advantage practised; it carries with it an appearance of reason; we would therefore recommend it to the lovers of nature and agriculture, to make repeated and diligent experiments, and let us know the result of their observations.

proud to learn of them, because in Ireland agriculture is not in so flourishing a state as in England.

Some few farmers have (to do them justice) practised this method in our own country; but contenting themselves with the profit resulting from it, they have not propagated the knowledge of the many advantages they are sensible may be derived from this practice, of giving salt to cattle.

The farriers and horse-jockeys know well the use of salt; they mix it often in their medicines, and find, by experience, that nothing proves so powerful a stomachic to horses, as a little salt thrown into their oats.

If the hints I have given are of service, it will give me great pleasure: but I must farther observe, that the use of salt is very proper when cattle are turned into clover, lucerne, or cole-feed; to feed: it is well known, that, on these occasions, they are apt, unless great care is taken, to be surfeited; the salt would prevent this accident, and thereby greatly accelerate the fattening of the cattle, and make it much safer to the farmer.

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*Directions for Hiring a Farm. From the Farmer's Calendar.*

**W**HEN a Farmer has occasion to look out for a farm, he should be equally clear-sighted to all the advantages of a farm, and all the disadvantages, that he may be able to draw a balance between them, and compare that balance with the rent demanded. Let him remember, that he must equally discard a too solicitous prudence, which doubts every benefit, and a too daring courage, which overlooks or lessens real evils. It must be open to almost every person's observations, that the common farmers lose themselves very much in deliberating concerning a farm: they have so many mistaken rules of judging, that we very often see them reject farms that, soon after, prove the fortunes of such as hire them: they are very apt to take one false guide in particular, the success of the last tenant. If a man makes a good deal of money on a farm, or leaves it for a much larger, numbers will immediately apply with great eagerness to get it, almost without viewing; but if a tenant or two breaks, or is poor on a farm, most of the neighbours consider little further: they attribute all to the land, and avoid it under a strong idea, that without a fall of rent, no money can be made on it. All these notions are absolute absurdities; for the management of various farmers is so essentially different, that success depends very little

on rent. A farmer, with a proper sum of money in his pocket, hires a farm, and thrives on it; another, with an hundred pounds less, hires it, and starves. Two farmers of the same substance; one manages his land with spirit, makes all the manure he can, sells no straw, does not cross-crop his fields, drains them, and keeps his fences in good order; he grows rich: The other, a sloven in these particulars, falls into poverty on the same land. These are the circumstances, that make one man rich, and another poor; very seldom rent: And surely it must be apparent, that succeeding occupiers, judging of the respective farms by the different success of these farmers, is taking as blind a guide as they can possibly fix on.

Let the farmer that is debating, whether he should hire a farm that is offered him, examine the soil well, to be able to determine its nature, the stiffness, moisture, exposure, levelness, slope, stoneyness; what draining, manuring, fencing, &c. will be wanting; let him see to the roads, distance of market, prices of commodities, labour, &c. He should attend to the compactness of the fields, and consider well the covenants relative to the cropping them; for many such are extremely detrimental to a good conduct of the land.

One general rule in hiring a farm should never be forgotten: Fix on good land, and you can scarcely pay too much for it; but, for poor soils, the least rent is too high to be consistent with profit. By *poor soils*, however, are not to be understood such as have a command of lasting manures, that work great improvements; nor waste lands, that, under that false denomination, are often found the richest of all.

The mellow, rich, putrid, crumbling clays, or rather clayey loams, are of all soils the most profitable: such as will admit tillage soon after rain, and do not bake on hot gleams of sun coming after heavy rains, when fine harrowed; such land is better worth twenty-five shillings an acre, than many soils deserve a shilling.

Another matter of great import in the hiring a farm, is the taking no larger a one, than the sum of money a man can command will stock properly. A common fault among farmers is the hiring too much land for their money: they are extremely eager to farm as much as possible: the certain consequence of which is, the conducting the soil in a slovenly imperfect manner. A farmer should never desist from any work, which he knows to be right, from a want of money; and he can only prevent such a situation, by hiring no more land than he can manage in a matterly manner: For let any of them consider the difference between good and bad husbandry in all its branches, between the loss of one, and the certain gain of the other. Making a proper use of natural manures, such as marle, clay, plaster

plaster of Paris, &c. is never done, but by farmers that have plenty of money in their pockets. In the neighbourhood of great cities and towns, variety of manures are to be had, in some places cheap; but if the farmers have not money, how are they to make use of such advantages? For these and many other reasons, a farmer should never think of venturing on a tract of land, which he cannot absolutely command; that is, farm as seems best to him.

*An Instance of the Success of Plowing with Oxen. From Mr. Young's Farmers Tour.*

**A**T Langford, the seat of Wenman Cooke, Esq. I had the uncommon satisfaction of seeing a team of oxen in harness. That gentleman, who is one of the most spirited farmers in Derbyshire, is the first who has drawn them in this manner. He uses sixteen; and finds that they draw with much greater power than in yokes, the method in which he first tried them: They move much faster, and are more handy and convenient: He executes all his plowing and home carting with them, at much less expence than the same could be performed by horses, or by oxen in yokes: A striking proof of this is his plowing as much land in a day with three oxen, as the farmers do with four or five horses; a disproportion so amazingly great, that it decides the point at once, and in the clearest manner. He feeds them in summer on grass alone, and in winter on straw, on which he works them moderately; but if hard wrought, then they have hay or some turneps.

The harness is much the same as that for horses, excepting the collars opening to be buckled on, and also to their being worn in the contrary manner to those of horses, that is, the narrow end of the collars, which open, being downwards; and as the chains are fastened to them in the same direction as in horse-harness, the beasts of course draw much higher than horses; The line of the chains is almost up to their backs, but much above the chest. This variation Mr. Cooke thinks necessary, from the different shape of horses and oxen; and it is a circumstance deserving attention from all who may be inclined to follow this very useful example. I saw a team drawing a heavy load of bricks; and observed, that not one horse team in ten outwalked them. The drivers assured me, that they worked much better than when yoked; drew a greater weight, and were far more easily managed. One great benefit of this method, exclusive of the increased power, is the placing them in a single line in place of a double one, which in some  
forts



sorts of plowing, is extremely useful. Indeed, in general, the nearer the team is to the weight the greater its power; but this is not the case with oxen yoked, owing merely to that awkward untoward way of driving; for it is well known to all ox-drivers, that the beasts cannot exert their full force, from the inequality between the couples; as it is common for one beast to make its fellow draw all, an inconvenience totally removed in Mr. Cooke's method.

I cannot but earnestly recommend this very great improvement to all who are desirous of working oxen; and particularly to those who imagine, but falsely, that they cannot move as fast as horses; that they cannot draw an equal weight; and that in plowing they trample the land more: All which ideas, however true they might be in respect to the yokes, are undoubted mistakes if applied to the harnessed beasts. Mr. Cooke deserves much of his country, for the introduction of so excellent a method, which I should apprehend sufficient with unprejudiced persons to give the preference to oxen, notwithstanding all the common ideas in favour of horses.

*Thoughts on the Rot in Sheep. In a Letter from Benjamin Price, to the Bath Agriculture Society.*

**T**HE cause of the rot in sheep, says Mr. Boswell, in his late useful and ingenious publication, is unknown.—Mr. Arthur Young, in recapitulating all the information he could get, in his Eastern Tour, observes, that the "accounts are so amazingly contradictory, that nothing can be gathered from them;" but concludes, "that every one knows that moisture is the cause."

In differing from an author of Mr. Young's acknowledged merit, supported by the general opinion of mankind, I am led to examine my own sentiments with caution and distrust; but, unless it is only meant, that moisture is generally the remote cause, it will be difficult to account for the rot being taken on fallows in a single day, and in water meadows sometimes in half an hour, when in grounds of a different sort, although excessively wet and slabby, sheep will remain for many weeks together, uninjured.

Another opinion, which has many adherents, is, that the rot is owing to the quick growth of grass, or herbs that grow in wet places.

Without premising, that all bounteous Providence has given to every animal its peculiar taste, by which it distinguishes the food proper for its preservation and support, (if not vitiated  
by

by fortuitous circumstances) it seems very difficult to discover on philosophical principles, why the quick growth of grass should render it noxious;—or why any herb should at one season produce fatal effects, by the admission of pure water only into its component parts, which, at other times, is perfectly innocent, although brought to its utmost strength and maturity, by the genuine influence of the sun. So far from agreeing with those who attribute the rot to quick-growing grass, which they call *slimy*, insipid, and destitute of salts, to me the quickness of growth is a proof of its being endued with the most active principles of vegetation, and is one of the criterions of its superior excellence. Besides, the constant practice of most farmers, who, with the greatest security, feed their meadows in the spring, when the grass shoots quick, and is full of juices, militates directly against this opinion.

Let us now consider, whether another cause may not be assigned more reconcileable with the various accounts we receive of this disorder. If our arguments, however specious, are contradictory to known facts, instead of conducting us in the plain paths of truth, they leave us in the mazes of error and uncertainty.

Each species of vegetables and animals has its peculiar soil, situation, and food, assigned to it. Taught by unerring instinct, "the sparrow findeth her a house, the swallow a nest, and the stork in the heavens knoweth her appointed time." The whole feathered tribe, indeed, display a wonderful sagacity and variety in the choice and structure of their habitations. Nor can it be doubted, that the minutest reptile has its fixed laws, appointed by Him, whose "tender mercies are over all his works."

The numerous inhabitants of the air, earth, and waters, are strongly influenced by the seasons, and by the state of the atmosphere; and the same causes, perhaps that rapidly call myriads of one species into being, may frequently prove the destruction of another. Is it then improbable, that some insect finds its food, and lays its eggs, on the tender succulent grass, found on particular soils, (especially wet ones) which it most delights in?—or, that this insect should, after a redundancy of moisture, by an instinctive impulse, quit its dark and dreary habitation, and its fecundity be greatly increased by such seasons; in conjunction with the prolific warmth of the sun?

The flesh fly lays her eggs upon her food, which also serves to support her future offspring; and the common earthworm propagates its species above ground, when the weather is moist, or the earth dewy.

The eggs, deposited on the tender germ, are conveyed with the food into the stomach and intestines of the animals,  
whence

whence they are received into the lacteal vessels, carried off in the chyle, and pass into the blood; nor do they meet with any obstruction, until they arrive at the capillary vessels of the liver.—Here, as the blood filtrates through the extreme branches, answering to those of the Vena Porta in the human body, the secreting vessels are too minute, to admit the impregnated ova, which, adhering to the membrane, produce those animalcula that feed upon the liver, and destroy the sheep. They much resemble the flat fish called plaice, are sometimes as large as a silver two-pence, and are found both in the liver and in the pipe, (answering to that of the vena cava) which conveys the blood from the liver to the heart.

If the form of this animal is unlike any thing we meet with among the insect tribe, we shall consider, that it may be so small in its natural state, as to escape our observation.—Or, might not its form have changed with its situation?—“The caterpillar undergoes several changes before it produces a butterfly.”

The various accounts, which every diligent enquirer must have met with (as well as the indefatigable Mr. Young) seem very consistent with the theory of this disorder.

If dry lined land, in Derbyshire, will rot, in common with water-meadows, and stagnant marshes,—if some springy lands rot, when others are perfectly safe—is it owing to the circumstance of water, or that of producing the proper food or nest of the insect? Those who find their after-grass rot till the autumnal watering, and safe afterwards, might probably be of opinion, that the embryo laid there in the summer, is then washed away or destroyed.

With regard to those lands, that are accounted never safe, if there is not something peculiar in the soil or situation, which allures or forces the insect to quit its abode at unusual seasons, it may be well worth enquiring, whether from the coarseness of their nature or for want of being sufficiently fed, there is not some grass in these lands always left of a sufficient length to secure the eggs of the insect above the reach of the water.

Such who assert that flowing water alone is the cause of the rot, can have but little acquaintance with the Somersetshire clays, and are diametrically opposite to those who find their worst land for rotting cured by watering. Yet, may not the water which produces this effect, be impregnated with particles destructive to the insect, or to the tender germ which serves for its food or nest?

For solving another difficulty, that “that no ewe ever rots while she has a lamb by her side,” the gentlemen of the faculty can best inform us, whether it is not probable that the impregnated

pregnated ovum passes into the milk, and never arrives at the liver. The same learned gentlemen may think the following question also not unworthy their consideration :

Why is the rot fatal to sheep, hares, and rabbits; (and sometimes to calves) when cattle of greater bulk, which probably take the same food, escape uninjured ?

Is the digested matter, in the stomach of these, different from that of the others, and such as will turn the ova into a state of corruption; or, rather, are not the secretory ducts in the liver, large enough to let them pass through, and be carried off in the usual current of the blood ?

It seems to be an acknowledged fact, that salt-marshes never rot. Salt is pernicious to most insects. They never infest gardens where sea-weed is laid. Common salt and water is a powerful expellent of worms, bred in the human body.

I could wish the intelligent farmer would consider these truths with attention, and not neglect a remedy which is cheap and always at hand.

Lisle, in his book of husbandry, informs us of a farmer, who cured his whole flock of the rot, by giving each a handful of Spanish salt, for five or six mornings successively. The hint was probably taken from the Spaniards, who frequently give their sheep salt to keep them healthy.

On some farms; perhaps, the utmost caution cannot always prevent the disorder. In wet and warm seasons, the prudent farmer will remove his sheep from the lands liable to rot. Those who have it not in their power to do this, I would advise to give each sheep a spoonful of common salt, with the same quantity of flour, in a quarter of a pint of water, once or twice a week. When the rot is recently taken, the same remedy, given four or five mornings successively, will, in all probability, effect a cure. The addition of the flour and water will, in the opinion of the writer of this, not only abate the pungency of the salt, but dispose it to mix with the chyle in a more friendly and efficacious manner.

Were it in my power to communicate to the society the result of actual experiment, it would doubtless be more satisfactory. They will, however, I am persuaded, accept these hints, at least as an earnest of my desire to be serviceable. Should they only tend to awaken the attention of the industrious husbandman, or to excite the curiosity of some other enquirer, who has more leisure and greater abilities, I shall have the satisfaction of thinking, that my speculations, however imperfect, are not entirely useless.

1871

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*On the Improvement of worn-out Land, by Deep-trench and frequent Ploughing. Communicated to the Blockley and Merion Society, for promoting Agriculture and Rural Economy. By Richard Peters, Esq; President of the said Society.*

**W**HEN I took the liberty of pointing out defects in our mode of farming, I promised to use my endeavours to suggest remedies for evils, which I with prevailed only in our neighbourhood. Exceptions are happily to be met with: but the stile of agriculture, under similar circumstances, is too much alike every where. It is the more unfortunate, as most of the inhabitants of exhausted lands seem to be the least ingenious and industrious, in calling to their assistance system and experiment, although they stand most in need of them. It should seem, that, as to them, the old adage, Necessity is the mother of invention, would not apply. Their spirits, and consequently their exertions, seem to fail them, and to be exhausted, in proportion to the degrees of impoverishment attending their soil. Even the industrious sow much, and reap little. As long as those, who possess it, can clear a piece of new land, they apply themselves to the tillage of it; and abandon the greater part of the residue of their farms to what they deem unconquerable poverty. If you enquire the reasons of their negligence, they will assign any but the true one—"They have not stock enough to make manure—they have not strength enough to work much land, and must therefore work that which yields the most—they have not money to purchase the means of re-invigorating their farms."

The fact is, that their not making the necessary and proper application of their stock and strength is the cause of the latter misfortune, which includes the rest. If their stock be small, it requires the more attention to produce profit from it: and if their strength be not great enough for two acres, let it be applied effectually to one. They will find their affairs in this case mend as if by magic. Their expenses will be less, and of course their profits greater. Their labour will have a limited—and, consequently, a practicable object. Savings in wear and tear of implements, of seed, of expense in wages, of expenditure to mechanics, with all the consequences of cultivating a small portion of land well, will immediately follow. They will not fail of the accomplishment of their object; but they will cease to bring themselves in debt by misapplied endeavours to avoid it. They will find, too, their one acre, well cultivated, more productive than many, in the old routine of mismanagement. The difference between a highly-improved acre and one even beyond mediocrity, is greater than at first view it would appear to be. In England, the proportion of  
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rent between land producing five quarters, and that bringing three quarters per acre, is often more than two to one. Yet the produce is not double. But after labour and expence, which are the same in both, the excess is profit: and the tenants, at the highest rents, clear the most money and become rich, while it frequently happens, that the others become bankrupts.

These observations are the most applicable to those, who, like ourselves, have their lots cast in a country exhausted by bad tillage. With good and systematical culture, our situation would have been very different. Under good management, our lands would still have continued fertile: and we should not possess them in their present miserable state. The following remarks are intended to elucidate and confirm my observations on the "defects in our mode of tillage." —

One would think, that the bare recital of the common mode of preparation for wheat, too generally accomplished here in one year, though in well-informed countries it is not completed in less than three, would sufficiently point out the evil and the remedy.

In general the sod is turned or broken up in the spring, at the most four, but more frequently less than three inches deep. This sod is composed of a small proportion of grass roots. The roots of permanent and noxious weeds (whose fibres have formed a mat, pervading the greater part of the surface, where they run horizontally, and, if tap-rooted, striking as deep as the soil will admit) occupy the rest. The seeds of these weeds, both annual and perennial, have been dropping for years, ready to vegetate with the first stirring of the earth. In this wretched situation, it is ploughed most wretchedly, because superficially, and left without harrowing two or three months. It is then crossed; at the season of sowing, harrowed: the seed is then ploughed in, and thus committed to this miserable mass of clods, unbroken in the whole, or in part. In this mass are contained undecayed roots of weeds and vegetating blue and other unconquered fibrous grasses, which, unlike tap-rooted grasses, such as clover, are perils, and not assistants to grain. The seed is then left to take its chance, with this host of enemies to contend with. Added to these, a crop of Indian corn, a great exhauster, is often taken, in the season of sowing grain. This, with its other bad effects, prevents the plough and harrow from having their full operation. This is a true statement of the general practice, which, if we do not amend it, will prolong the causes of our complaints, that blue grass, garlic, and other weeds, choak and nauseate our crops; insomuch that our produce pays not for our labour and expences. Can it be supposed, that a plant, such as wheat

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(which will penetrate three feet, if the soil permit, and whose horizontal roots have been measured ten feet) will perfect itself in a depth of three or four inches, and in a collection of clods, tussocks of weed roots, and increasing mares of blue grass, which will prevent the extension of its roots and fibres? Will any one believe, that weeds, such as yellow weeds or St. John's wort, white weed or daisies, or blue grass, which require three years, with well attended fallow crops to destroy them, can be so backened in one season, as not materially to injure the winter grain, if not to choak it in whole or in part? Let such as conceive this, examine the vigour with which weeds grow after the crop is off, and consider how long wheat occupies the ground, and of course what opportunity this crop (contrary to the effects of fallow crops) gives to their increase and growth. Let them also consider, that clods contain, as in magazines, untouched fibres and loads of grass and weeds, ready to vegetate after a little rest; and that they also lock up so many mouths of the earth, which would, in a state of pulverization, receive the food and nourishment of plants from the dews and airs. Their candour would then, I trust, compel them to subscribe to what should be an agricultural maxim—"A farmer should let nothing grow but his crop."

Indolence makes large demands upon ingenuity, to furnish it with excuses. Some plausible reasons are brought forward to support every bad practice. I have heard it alledged in conversation, and have met with it in a treatise on St. Foin (the most extensive rooted vegetable of its tribe) that "Plants should not extend their roots too far, or they will spend themselves in root." As if nature was not too wise to suffer an injurious disproportion in the parts of her productions. Roots are to vegetables (as in that treatise it is observed) what the intestines and stomach are to animals. The more and larger these are, being always proportioned to the body of which they are parts the more and greater the supplies of nourishment received and communicated.

The remedies I will recommend, for the evils I have enumerated, are—deep trench and frequent ploughing,—I have had much experience of the good effects of these on lands, as much impoverished as any in this country, I have, therefore, no occasion for authorities to satisfy myself.—But I will quote one instance among many which might be produced. The celebrated Chateauvieux, a philosophic and attentive cultivator, selected a piece of ground, from which he had taken the soil three feet deep, leaving only a sterile, whitish clay. By digging and stirring this spot, he brought it, in three years, to bear wheat without manure, as large and as fine as any his garden



garden could produce. This shows that earth supposed barren, can be made, by stirring, separating its parts, and exposure to the influences of the air, as productive as the original surface. It fully answers the objections to deep and trench ploughing, of turning barren earth; for the worst earth may be made thus fertile. Miller also affords instances in proof, from the practice of the gardeners about London. They trench their grounds, when they begin to be exhausted, three feet deep, turning the original surface to the bottom.

To perform the operation of tranching, which is unnecessary above once in seven years, I have a plough in the common form, but large and strong—the mortise in the beam long, so as to admit of altering the inclination of the coulter, as you would wish to go deeper or shallower; and the mould-board is constructed so as to cast off more earth than the common plough. With this plough, drawn by two oxen and two horses, or four of the former, I begin by running as deep a furrow as possible. The next operation is made with a light plough and two horses; which pares off the sod two inches deep, with a broad furrow, turning this sod into the trench, with all its weeds, roots, and other pests to your soil. These are completely covered by the large plough, somewhat narrower than the small one, and which running in the same furrow throws over a body of earth, which buries these nuisances; most of which, being placed beyond vegetation, ferment, rot, and become blessings, by adding to the fertility of the soil. The depth from ten to fourteen inches, as your soil will bear. This, when I can do it, I have finished before winter. Next season I give it a light dressing with lime, dung, or such other manure as I can obtain, and work it well with Indian corn, the most common fallow crop we have.

In trenching, I am satisfied if I complete three quarters of an acre in a short day, though sometimes I do more. My plough runs, in the years succeeding the trenching, no deeper than is required in good common ploughing, perhaps five or six inches. I frequently sow buckwheat, and plough it in, when in full blossom, as a green manure and covering crop. I have raised potatoes, tap-roots, and cabbages, in ground thus prepared, as fallow-crops, to great advantage. The effects have answered my most sanguine expectation: and I therefore warmly recommend it. Be not uneasy if your profits be not immediate. Time and tillage are required, to impregnate this new earth, which has in itself less food for plants, than it will obtain from the air by stirring and exposure. To those, who will not confine themselves to a spot within their power to trench, I would recommend (if they will not, as I always prefer, use that much-neglected but profitable animal,

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the ox) adding another horse to their plough, and deepening their furrows; making it an object to turn up their fallows in the fall. This will be a step towards good husbandry. If to this they will add one or two extraordinary ploughings, the succeeding crops will amply repay them.

The method I recommend is not without its exceptions, of which the farmer, from small essays; must inform himself. The depth must be regulated by the staple; and there are some soils not proper for wheat, and evidently improper for trenching; though these are few. I know, too, that some, and particularly clay-farmers, are attached to their clods: because they say they keep the ground from consolidating, or, as they call it, faddening or poaching. But it is best not to sow wheat on such soils, till prepared by good tillage, with some manure and a good course of cropping, as well fallow as covering, to precede this, which is justly stiled the golden grain. When thus prepared, the fermentation introduced by the manure, and perhaps by the phlogiston, or whatever be the food of plants, will cause a repulsion between the particles, and the very nature of the soil will be changed. Be the cause what it may, (for I pretend to no precise knowledge of these hidden operations of nature) it is well known, that soil thus treated, lies light and loose; and therefore to keep it asunder, has no occasion for clods; to which even stones (as they retain moisture and contain no noxious roots or seeds) are, in many respects preferable. Nor will this soil be spewy, as it is commonly termed; as the roots will take deep hold, and want not the shelter or gradual nourishment, which those, who are advocates for clods, hold out as necessary in shallow-ploughed grounds.

Instances are not wanting, where good crops have been obtained, harrowed in at one ploughing, late in the autumn, when the vegetation of the weeds and grass has been choaked or ended for the season. This may, with good luck, serve a turn. The crop may get the start of the weeds and grasses; which they revenge by growing with more vigour when it is off. It is, on this account, bad farming; and should rather be treated as a fortunate exception, than as a rule. I do not here allude to wheat, sown at one ploughing, on a clean clover-ley; for this is a valuable part of the rotation system of farming. I will close this part of the subject with a quotation from Duhamell—"It is often more advantageous to encrease the fertility of the land by ploughing, than by dung. Because in general only a certain quantity of dung can be had; the produce of twenty acres being scarcely sufficient to produce enough for four or five; whereas the particles of the earth may be divided and subdivided almost to infinity. The help,  
derived

derived from dung, is therefore limited, while no bounds can be set to the benefits derived from ploughing." This observation, of one who was an enthusiast for the drill husbandry, may be somewhat tinged with attachment to system: truth is generally between the extremes, to which the advocates for favourite systems extend their speculations: manures must never be neglected. But, with them, the practice here recommended should be seriously attended to. It will render their efficacy more beneficial, and of course require the smaller quantity. Without them it is the best substitute, that those, who cannot or will not obtain them, can apply.

With all this, the farmer must not be in too great haste to obtain his ultimate profit. Time is required in the preparation.

Fallow crops, which either cover or force tillage, will repay the expense in the necessary stages of improvement. We must not crowd into one season, the business which will be ineffectual, unless three or four years be devoted to it. When the end is accomplished, its effects are not transitory; but permanently profitable; and the persevering cultivator will long continue happy, in the well-earned and rich reward of all his patience and all his toils.

Thus have I endeavoured to comply with the wishes of the society, by proposing what to me appears "the best method of improving worn-out lands." If the means, I have offered, be well known to the experienced agriculturists of Europe, or of our own country, they are the more to be relied on. Our profession derives substantial advantages from well-directed practice and experiments perseveringly executed. Theories, however new, ingenious and amusing are of little use, unless proved beneficial by these indisputable tests.

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*Utility of preparing Seed-Oats with Plaster of Paris. Addressed to Samuel Powel, Esq; President of the Philadelphia Agricultural Society.*

## LETTER I.

SIR,

**P**ERMIT me through you to lay before the Agricultural Society, the result of the following little experiment, so far as I have as yet been able to ascertain it.

Late in the month of April last, having a piece of ground in the vicinity of the borough of Lancaster, prepared to be sown with oats, which I supposed would take sixteen bushels of seed, the evening before it was to be sown, I had eight bushels put into a trough, and covered with water. The next morning

the water was drawn off, and the oats laid in a heap, to drain, for a short time, say half an hour; then Plaster of Paris in powder was thrown on, by small quantities at a time, and mixed with the oats, till they acquired a sufficient degree of dryness to be sown evenly; in this process one bushel of the Plaster was consumed: the seed thus prepared, and dry seed from the same original heap, were sown on alternate lands throughout the field. The whole came up together, and in due time, and no difference was visible for seven or eight days. From that time forward, the distinction became very evident; the oats on the lands sown with the prepared seed were much more luxuriant and of a deeper green, until they began to ripen—On the second instant they were cut, being then perfectly ripe, while those on the lands sown with the unprepared seed were yet green, the heads much smaller, and promising in every respect a worse crop.

On the eighth I left home. They were then unfit to cut, and appeared as if they would not be ripe for five or six days after—To the facts above stated, many of my neighbours are witnesses.

I mean to have the oats, produced from the prepared and unprepared seeds, threshed separately, to ascertain with precision the difference in the quantity and quality of the produce, which shall be communicated to the society, so soon as conveniently may be.

I have the honour to be,

SIR,

your obedient,  
humble servant,

EDWARD HAND.

Philadelphia, August 17, 1790.

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LETTER II.

Lancaster, March 14th, 1791.

SIR,

IN August last, if I recollect right, I troubled you to communicate to the agricultural Society the result of an experiment I made, the preceding April, by preparing seed-oats with Plaster of Paris, so far as the same could then be ascertained. Having since determined the difference of the produce from the prepared and unprepared seeds, I beg leave to lay it before the society--The produce of the eight bushels of prepared seed was one hundred and twenty-two bushels and about a peck; of the like quantity of unprepared seed, ninety six bushels, the

the former yielding an increase of fifteen and a quarter for one, or thirty and a half bushels to the acre; the latter only twelve for one, or twenty-four bushels to the acre. The produce of the prepared seed weighed thirty-three and a half pounds the bushel, that of the unprepared only thirty-two and a quarter pounds,—so that for about five shillings, the expence of a bushel of Plaster of Paris, I gained twenty-six bushels of oats; and by allowing for the increased weight, one and a quarter pound a bushel, on one hundred and twenty-two bushels, I may fairly add four and a half bushels more, making in the whole thirty and half bushels.

I am, Sir,

with much respect,  
your obedient humble servant,  
EDWARD HAND.

*Published by Order of the Society.*  
SAMUEL POWEL GRIFFITHS, Secretary.



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