

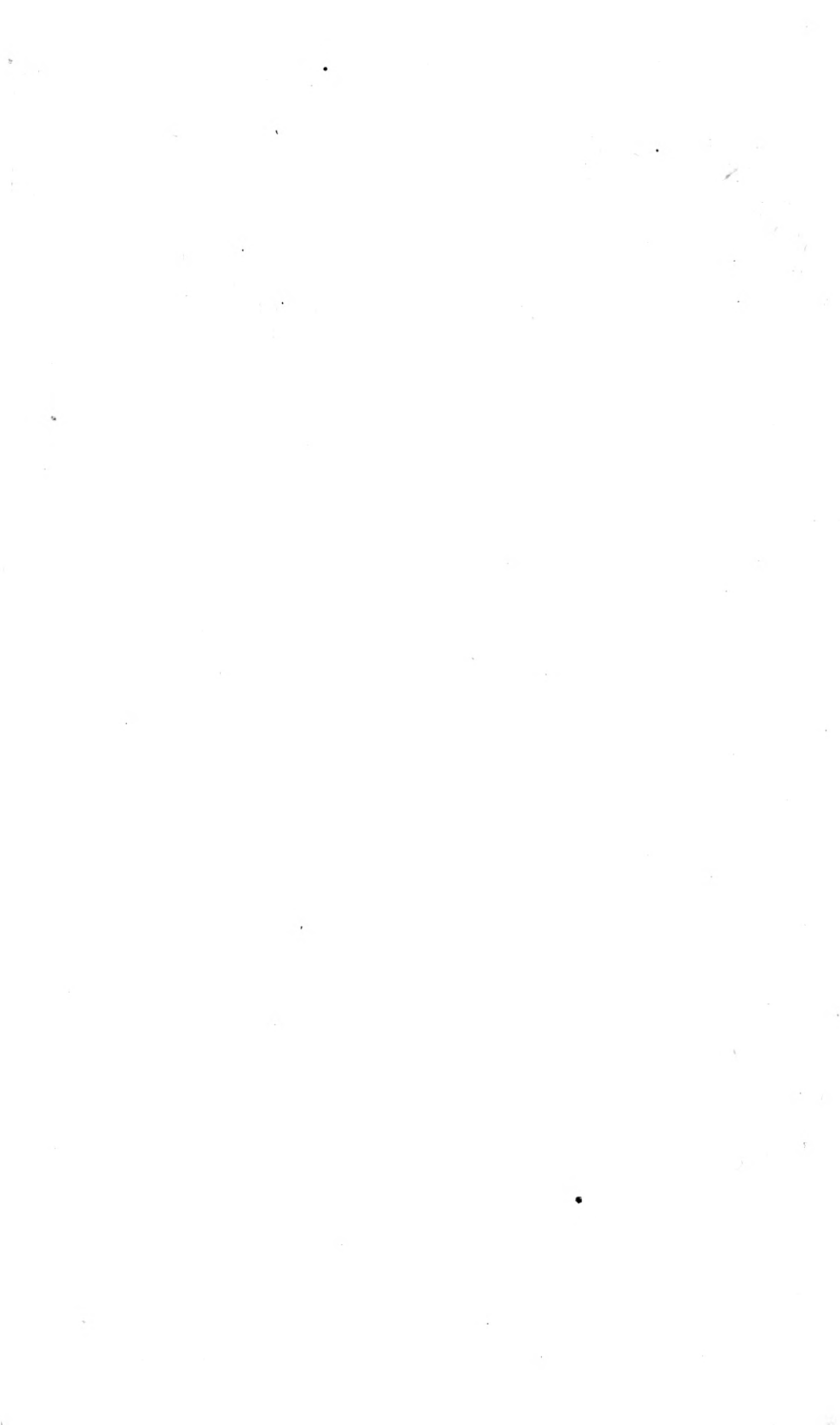
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THE

Massachusetts Agricultural

REPOSITORY and JOURNAL.

WITH ENGRAVINGS.

VOLUME V.

CONDUCTED BY THE TRUSTEES OF THE MASSACHUSETTS AGRICULTURAL
SOCIETY.

BOSTON :
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PREFACE.

SOME apology may be thought necessary for occupying so large a part of the present Number with the reports and documents, which relate to the late cattle show at Brighton. When, however, the reasons which induced the Trustees to give so detailed an account shall have been stated, they hope they will be deemed a sufficient justification.

If the useful and ornamental arts are susceptible of encouragement and improvement by publick rewards and exhibitions, or if any advantage can be supposed to be derived from such competition, it can scarcely be questioned, that these beneficial effects will be promoted by giving an extensive circulation to the history of such competitions. There has been scarcely an age or nation, in which the effect of publick exhibitions and rewards has not been tried. Among the ancient nations, they were instituted to encourage skill in horsemanship, in the management of ships, and in athletick exercises, chiefly with a view to fit and improve the combatants for war. In more modern times, they have been employed for the encouragement of the art of painting, or for the purpose of improving the breed of horses. It is only within a few years, we believe, that in Europe or America, this important principle of competition has been applied to the advancement of the most important of all arts, Agriculture.

It must be unnecessary to adduce any arguments to shew, that such exhibitions tend to the encouragement of this art. The continuance and extension of them, from year to year, in almost every part of Europe; the rapid improvement in the animals and productions offered for

exhibition; the ardour with which they are attended, and the deep interest exhibited by the competitors, as well as spectators, preclude the possibility of doubt.

Such exhibitions serve to bring the agricultural art into greater credit, and to advance its professors to the high standing which they deserve. They make known more completely the powers and capabilities of a country; they draw from obscurity the modest, but ingenious and intelligent cultivator; and by making apparent the superiority of his productions, lead to a knowledge of the art and skill by which he was enabled to bring them to perfection. Who, for example, would have supposed, that Massachusetts could furnish an animal like the Oakes cow, capable of producing nearly 500 pounds of butter in a season? And how important to learn, that a very considerable portion of this product was owing to a liberal manner of feeding, which would astonish and alarm most farmers, and yet which was amply repaid by the increased productions?

There are other reasons for such a publication of the result of the late exhibition. It is in this country, as yet, but an experiment. To the munificence of the government of this Commonwealth, are the Trustees, in a considerable part, indebted for their ability to offer such a number of rewards, and to so liberal an amount. A very small portion only of the people can be witnesses of the exhibition. The Trustees, therefore, as agents for the publick, and in some degree entrusted with the application of the publick money, owe to the whole community a full and satisfactory account of the effects of these rewards. The Trustees have, it is true, published a succinct history of the claims and decisions, but there are material defects in this mode of proceeding, and it was adopted only to satisfy the momentary curiosity of the publick. Some persons might retain a degree of incredulity as to some particulars, such as the amount of agricultural productions for which premiums had been granted, or the times in which the several com-

petitors in the ploughing match performed their labour. As an example of this skepticism, it may be remarked, that some of our neighbours were very pleasant upon the speed of our oxen. The Trustees have no disposition to spoil a little pleasantry, but they would wish to prove to the world, that they are not in the practice of publishing extravagant accounts. They have, therefore, resolved to print the separate reports, on every branch of competition, with all the documents and vouchers which accompanied them.

They form a body of evidence, which would be sufficient to establish facts of much greater importance, and points of a much more incredible character. To the report of our ploughing match, at Brighton, they have subjoined an account of the best trial of the same nature, which they could find in the Bath and West of England Society's papers; and to the official return of the weight of our prize oxen, they have added the weight of the largest ox ever slain in England, and whose size is on record.

It may be of use, and produce confidence in the decisions of the Trustees, to state, that in every branch in which any one of the Trustees was a competitor, there were two judges of great skill and irreproachable character chosen out of the board, and not one Trustee was permitted to sit even as a member, much less to give a vote on any Committee appointed to decide on any class of articles, in which such Trustee was a competitor. In addition to which it may be remarked, that there were as many claims of Trustees rejected, as there were of other persons, in proportion to their respective numbers. A transaction, which merits the thanks of the community, has in some instances been either misunderstood or misrepresented. An idea has prevailed in some places, that the Trustees had purchased the cattle to which the first premiums were awarded. The fact is not so. The Springfield oxen had been celebrated for a year past. They were supposed to

be the finest ever produced. There was a strong desire on the part of many persons, that Massachusetts might have the credit she deserves as a grazing country. Col. Chapin was not willing to drive his cattle to Brighton, at his own risk.

Some generous publick-spirited gentlemen, out of the board, and a few within it, subscribed a sum to purchase the cattle, in order that they might be exhibited at Brighton, and at a certain, inevitable, expected loss. They paid 1050 dollars for the oxen. Col. Chapin drove them down, and, as was agreed, took the premium himself in part payment for them. They were not exhibited, as they might have been, for profit as a show. There has been, as was expected, a loss, but the remuneration consists in having shewn to thousands of spectators, the finest animals *probably at that moment* in the world, the products of the rich pastures of Massachusetts.

To conclude, this account ought to be continued annually in the present form, as it serves as a foundation for a complete history of our agriculture. How valuable would be such a document respecting the agriculture of Rome, under the republick, and the emperours, and of Great Britain, even if it were but one in each century. We rejoice to see similar societies springing up in every part of our country. Publications emanating from them will make us much better acquainted with the progress of cultivation, and the comparative wealth and advancement of the different sections of the United States, than we can in any other way become.

MASSACHUSETTS
AGRICULTURAL JOURNAL.

VOL. V.

JANUARY, 1818.

No. 1.

ACCOUNT OF THE CATTLE SHOW AND EXHIBITION OF AGRICULTURAL PRODUCTS AND MANUFACTURES AT BRIGHTON, IN THE COUNTY OF MIDDLESEX, NEAR BOSTON, MASSACHUSETTS, ON THE 14th AND 15th DAYS OF OCTOBER, 1817, WITH ALL THE REPORTS AND DOCUMENTS RELATIVE THERETO.

THE premiums offered by the Society, amounted to upwards of 1300 dollars, of which the Legislature had by resolve contributed 500.

The Committees appointed to judge, and award premiums, were as follows. Those with a star prefixed are not of the board of Trustees, but were selected for their skill and reputation, as suitable persons to decide such questions.

COMMITTEE FOR AWARDING PREMIUMS ON CATTLE.

Hon. Josiah Quincy,	*Willard Gay, Esq.
Ezekiel H. Derby, Esq.	*A. White, Esq.
John Lowell, Esq.	

COMMITTEE ON WORKING OXEN.

Hon. Josiah Quincy,	*Willard Gay, Esq.
E. H. Derby, Esq.	*A. White, Esq.
Hon. John Welles,	

COMMITTEE ON AGRICULTURAL EXPERIMENTS.

Hon. P. C. Brooks, J. Prince, Esq.
S. W. Pomeroy, Esq.

COMMITTEE ON MECHANICAL INVENTIONS AND AGRICULTURAL MACHINES.

Same as the last.

COMMITTEE ON DOMESTICK MANUFACTURES.

Thomas L. Winthrop, Esq. *Mr. John Fox,
Samuel G. Perkins, Esq. *Mr. Wm. Lawrence.
Hon. Richard Sullivan,

COMMITTEE ON PLOUGHING MATCH.

E. H. Derby, Esq.
Gorham Parsons, Esq.
*General Gardner, *of Brooklyn.*
*Capt. J. Curtis, *of Roxbury.*
*Jonas White, Esq. *of Watertown.*

 REPORT ON THE CLAIMS OF COMPETITORS FOR THE
BEST DOMESTICK ANIMALS.

The Committee appointed by the Massachusetts Society for promoting Agriculture, to consider claims for premiums on stock entered at the Cattle Show at Brighton, on the 14th of October, 1817, have attended that service, viewed all the animals offered, and made such inquiries and examinations as the time of exhibition allowed; and as they deem sufficient for an intelligent exercise of their judgment on the subjects submitted to their consideration.

Previously, however, to making any statement of the result of their investigation, a sense of justice to themselves and to the various gentlemen, who have, on this

occasion, entered into competition, compels them to observe, that the number and the general excellence of almost all the animals offered for premium, has rendered the duty imposed upon them, both difficult and delicate. This remark is peculiarly applicable to their situation, in relation to the claims on account of Bulls and of Merino Sheep, in both of which classes of premiums, the objects offered have been numerous, and the circumstances, ultimately concurring to decide their minds, have not been, in every instance so strong and conclusive, as to enable them to rely, in every instance, with perfect confidence on their own judgment. Much less then, can they hope that it will give entire satisfaction to those interested in the animals, whose claims have not been successful; and possibly, not even to the publick. They rely, however, with confidence, that as general satisfaction will be given as is usual, on occasions of this nature, where the particulars, which constitute the difference among animals are minute, often slight, which a hasty or irresponsible observer would not notice, and concerning which, men even of experience and equal judgment, might doubt, and perhaps differ.

Your Committee, therefore, present this report in relation to many of these objects, as the best judgment they can form, in comparisons of unquestionable difficulty, concerning which their duty compels them to decide, rather than as an infallible criterion of the relative merits of these objects. Had the premiums of the Society permitted, they would gladly have extended them to other objects, possibly of equal, and certainly of not very inferior merit, to those they have selected. But restricted as they are to a fixed number and amount of premiums, they can only lament, that the funds of the Society do not permit them to do more justice to the numerous claims on its encouragement, which the qualities of the animals exhibited have presented.

With this general explanation of their sentiments, they ask leave to report.

In relation to the claim for fat oxen, those presented by Col. Chapin, were without competitors. In point of weight, size, and beauty, they have probably never before been equalled, in this country, and very seldom in any other.

Your Committee therefore adjudge, that COL. CHAPIN is entitled to the *first premium* for fat oxen, on account of his brown Ox ;—which, although it was less in weight than the other, was, in the opinion of your Committee, unquestionably the fattest ox.

Your Committee also adjudge, that COL. CHAPIN is entitled to the *second premium* for fat oxen, on account of his largest Ox.

The third premium for fat oxen, they adjudge to JOHN PARKMAN, Esq. of Brighton.

In relation to the claims for the best Bull, your Committee adjudge, that the HON. SAMUEL DANA is entitled to the *first premium*.

And that CAPT. BENJAMIN HARRINGTON, is entitled to the *second premium*.

In relation to the claim for the *best Cow*, your Committee adjudge, that the first premium ought not to be awarded, on the present occasion, to either of the competitors, whose cows had been regularly entered, in as much as your Committee think that cows, equal to any of those offered, are not very uncommon.

Justice, however, obliges them to remark, that had Dr. Stearns's Cow been entered, according to the regulations established by the Society, they should not have hesitated to adjudge to him the first premium.

Your Committee adjudge the *second premium*, under this head, to the HON. JOHN WELLES, and the *third premium* to CAPT. BENJAMIN HARRINGTON.

In relation to the claim for *imported Cows*, your Committee adjudge, that GORDAN PARSONS, Esq. is entitled to the *first premium*.

In relation to the premium for the best *boar*, your Committee adjudge, that NATHANIEL INGERSOLL, Esq. is entitled to the *first premium*.

And that Mr. STEPHEN ROBBINS is entitled to the *second premium*.

In relation to the premium for the best *sow*, your Committee adjudge, that NATHANIEL INGERSOLL, Esq. is entitled to it.

In relation to the premium for *store-pigs*, your Committee have adjudged, that none ought to be awarded. Those presented being, in their opinion, entitled to no premium, as they believe as good or better are not uncommon.

In relation to the premium for *merino rams*, your Committee adjudge, that Dr. BENJAMIN SHURTLEFF is entitled to the *first premium*.

And that NATHANIEL INGERSOLL, Esq. is entitled to the *second premium*.

In relation to the claim for the best *merino ewes*, your Committee adjudge, that SAMUEL JAQUES, Esq. is entitled to the *first premium*.

And that JOHN PRINCE, Esq. is entitled to the *second premium*.

In relation to the claim for the best *merino wethers*, your Committee adjudge, that GORHAM PARSONS, Esq. is entitled to the *first premium*. For the second premium there was no competitor.

In relation to the claim for the best *native wethers*, your Committee adjudge, that Dr. EPHRAIM WILSON is entitled to the *first premium*. For the second there was no competitor.

All which is respectfully submitted, by order of the Committee.

JOSIAH QUINCY, *Chairman*.

Brighton, 15th Oct., 1817.

The Committee appointed by the Massachusetts Society for Promoting Agriculture to consider claims for premiums on the best working oxen entered at the cattle show at Brighton, on the 15th of October, 1817, have attended that service, and carefully weighed the pretensions of the different competitors, conformably to the instructions of the Board of Trustees, and to the rules and regulations previously established to guide their decision.

These rules and regulations requiring that they should, in forming their opinion, consider *not merely the strength of the cattle*, but also their *age, size, equality of match, and other general circumstances*, they have accordingly adjudged the premium with reference to all these considerations combined.

They deem themselves compelled to this remark, as, if mere strength had been the criterion, their decision would have been different.

Under this general explanation, they ask leave to report, that they adjudge the *first premium* to Luke Fisk; the *second premium* to Asa Andrews; the *third premium* to Col. Wyman.

All which is respectfully submitted, by order of the Committee.

JOSIAH QUINCY, *Chairman.*

Brighton, 15th Oct., 1817.

The Committee for the examination of Domestick Manufactures, report a recommendation of premiums to be awarded as follows:—

To Mr. James Shepherd of Northampton, for the best specimen of broadcloth, the premium of *fifty dollars*.

To the Walpole Manufacturing Company, for the next best specimen of broadcloth, *thirty dollars*.

To Mr. Stephen Thacher of Kennebunk, for woollen cloth manufactured in his family, *twenty dollars*.

To the Dorchester Cotton and Iron Manufactory, for cotton cloth, *twenty dollars*.

To Asa Richardson, for a cotton and woollen Coverlet (woven) of good fabrick, manufactured in his family, *ten dollars*.

To Mrs. Mary Farley, widow, of Ipswich, for a fine knit Shawl, partly of native and partly of half blood merino wool, *five dollars*.

To Miss Ann Somes Trask, for a pair of woollen Stockings, of great fineness and beauty, *five dollars*.

This being the first time of the exhibition of domestick manufactures at Brighton, the Committee were not surprised to find the competition limited to so few persons, nor that the importance of entering the articles within the time fixed, should not have been fully understood.

One case of exclusion from a claim of premium for non-compliance with the rule, prescribing the time of entering, the Committee particularly regretted, that of Mr. John Dwelly of Quincy, whom they should have recommended for a premium, for a handsome specimen of Carpeting, manufactured of native wool in his own family, had his name been entered in due season.

Another instance of exclusion, for the same reason, that of the Cotton Manufacturing Company at Waltham, ought not to preclude the Committee from laying before the Board of Trustees, information, incidentally obtained, of the unexampled enterprise, perseverance, and success of this manufacturing establishment. At this Factory, there are now in operation *sixty looms*, moved by water. *Twelve hundred yards* are woven in a day, on an average, through the year. *One hundred and fifty-one thousand, nine hundred and forty-seven yards* in a period of *twenty weeks*, between the 14th day of April and the 30th of August. It is stated, that the demand for the cloth is much greater than can be supplied.

The premium for cloth manufactured in private families, having been claimed by one person only, the Committee, finding the cloth to be of a good quality, have recommended that the premium be given to Mr. Stephen Thacher, the sole claimant, for the following reasons:—

First, That the general objects of the Society authorize whatever may tend to promote industry in private families.

Second, That fabricks of equal quality may, in general, be manufactured in families at less expense than in large factories.

And thirdly, That awarding a premium, at this time, will serve to awaken the attention of the publick to this interesting branch of manufacturing industry, and produce a greater number of competitors the next year. It will be observed, also, that this premium for private manufactures is recommended to be awarded to Mr. Thacher, notwithstanding the specimen of cloth exhibited was not of broadcloth width, and, for the reason, that cloth of double width is rarely, if ever, manufactured in private families, nor can be, without so much inconvenience on account of the width of the loom, as to render it improbable that the manufacture can be carried on extensively, under any encouragement, by premiums.

The Committee do not feel themselves at liberty so to construe the last article of premiums for manufactures, which contains a general provision for fine specimens of any fabricks of cotton and wool, as to entitle persons, exhibiting articles of small value, although of exquisite workmanship, to the full premium of *twenty dollars*; therefore, considering this sum as the *maximum*, they have exercised a discretion in recommending premiums of less value in three cases.

THOMAS L. WINTHROP,
SAMUEL G. PERKINS,
RICHARD SULLIVAN,
WILLIAM LAWRENCE,
JOHN FOX.

Brighton, Oct. 15, 1817.

The Committee, consisting of E. Hersy Derby, Gorham Parsons, General Gardner, Captain J. Curtis, and Jonas White, Esquires, to whom was referred the ploughing match, have attended that business, and, agreeably to notice repeatedly given to the publick, repaired to the ground selected for the purpose, belonging to Mr. Francis Winship, which was staked into twelve lots, two rods in width, and twenty rods in length, and each piece of ground, as drawn by lot, was pointed out to the different competitors, and it was found that the eleven following persons had entered for the premiums, and drew lots as follows:—

Mr. Jesse Warren of Dedham, lot No. 1, which being considered a little inferiour to the others, on account of an apple tree situate in it, and there being but eleven competitors, was permitted to take Lot No. 12.

A plough of his own manufacture. Ploughman, Jesse Warren. Driver, John D. Ramsey. One yoke of oxen. Work performed in 53 1-2 minutes.

John Prince, Esq. of Roxbury, Lot No. 2.

A Beverstone Plough, imported from England by Mr. Prince. Ploughman, Thomas James. Driver, Thomas Glover. Two yoke of oxen. Work performed in 36 minutes.

Mr. Reuben Hastings of Brighton, Lot No. 3.

A common grass plough, made by Wesson of Sutton. Ploughman, Mr. Reuben Hastings. Driver, Luther Claflin. Two yoke of oxen. Work performed in 35 minutes.

Mr. John Warren of Brookline, Lot No. 4.

A common plough, made by a Mr. Hall. Ploughman, Mr. John Warren. Driver, Mr. John Warren. One yoke of oxen. Work performed in 41 minutes.

Mr. Nathan Adams of Medford, Lot No. 5.

A common grass plough, made by Mr. Swan of West Cambridge, wheel on the beam. Ploughman, Mr. Nathan Adams. Driver, Carpenter Stanley. Two yoke of oxen. Work performed in 39 minutes.

Mr. Josiah Severns of Roxbury, Lot No. 6.

Common grass plough, made by Mr. Fisher of Dedham, wheel on the beam. Ploughman, Noah Hardy. Driver, Joseph Chase. Two yoke of oxen. Work performed in 31 minutes.

Mr. Samuel Ward of Roxbury, Lot No. 7.

Common grass plough, made by Mr. Sibley of Westborough, with a foot on the beam. Ploughman, Samuel Clark. Driver, Thomas Perkins. Two yoke of oxen. Work performed in 30 minutes.

Messrs. Leavitt and Howard of Hingham, Lot No. 8.

Plough of their own manufacture. Ploughman, Ezekiel Cushing. Driver, Ebenezer Stedman. One yoke of oxen. Work performed in 40 1-2 minutes.

Mr. Francis Babcock of Woburn, Lot No. 9.

Common grass plough, made by Mr. Brown of Bedford, wheel on the beam. Ploughman, Nathan Harrington. Driver, Nathan Harrington, Jr. Two yoke of oxen. Work performed in 39 minutes.

John Parkman, Esq. of Brighton, Lot No. 10.

Common grass plough, made by Mr. Phelps of Marlborough, with a machine invented by Mr. Luke Johnson. Ploughman, Mr. Luke Johnson. Driver, John White. One yoke of oxen. Work performed in 42 minutes.

Mr. Thomas Park of Brighton, Lot No. 11.

Common grass plough, made by Mr. Osborne of Sudbury, with a wheel on the beam. Ploughman, Mr. Thomas Park. Driver, William Brown. One yoke of oxen, one horse. Work performed in 43 minutes.

Your Committee are impressed with the merit of every competitor, and feel that all deserve very great consideration from the Board of Agriculture, but, in a more particular manner, John Prince, Esq. of Roxbury, for the great assistance given the Committee by him, in every particular relating to the ploughing match, and at the same time cannot refrain from remarking, that he was very unfortunate in his lot of ground; having been an old cart way,

and having a large rock directly under the surface, which we feared had broken the plough the second time of its going round, and prevented, for several rounds, the furrow being laid so level and smooth as it otherwise might have been. Also, Mr. John Warren of Brookline, who, with a common plough, and one yoke of oxen, himself both ploughman and driver, executed his work in a fine style.

In respect to the ploughs employed, your Committee think very highly of some of them, particularly of the Beverstone plough, imported by John Prince, Esq., which makes excellent work, and is drawn with great ease, both to the ploughman and the oxen. Also, the plough manufactured by Messrs. Leavitt and Howard of Hingham, Ezekiel Cushing the ploughman, drawn by one yoke of oxen, a very fine plough, managed with great coolness, and the work executed in a masterly manner. Also the plough made by Mr. Jesse Warren of Dedham, he both owner and ploughman, drawn by one yoke of oxen, an excellent plough, turns a good furrow, runs with great ease, and almost guides itself; but the ploughman more attentive to the exhibition of his plough, than the execution of his work.

Your Committee beg leave to report, and they award, after much consideration and feeling, that Messrs. Leavitt and Howard are entitled to the *first premium*.

20 dollars to the plough.

10 dollars to the ploughman, Mr. Ezekiel Cushing.

5 dollars to the driver, Mr. Ebenezer Stedman.

Mr. John Warren of Brookline, is entitled to the *second premium*.

12 dollars to the plough.

6 dollars to the ploughman.

3 dollars to the driver. All performed by Mr. Warren.
All of which is respectfully submitted.

E. HERSY DERBY, *Per Order*.

N. B. It should be remarked, that in order to prevent confusion, each ploughman was permitted to turn a single furrow round the piece of land allotted to him, and about three minutes must be added to the times occupied by the competitors respectively, on this account.



The Committee on inventions, found the following articles to have been entered for premiums, viz. :—

Threshing Machines.

Ploughs.

Drilling Machines.

A Straw Cutter.

An apparatus to aid in ploughing, by Luke Johnson, of Leominster. And after such an examination as they were able to make, they report, That, of the threshing machines which have been offered, though they discover much ingenuity in the inventors, no one seemed so perfect, or so decidedly useful, as to justify them in awarding a premium. Some of them, however, particularly one by Mr. Hodgkiss, for threshing and winnowing, and one by Messrs. Gay and Bullard, for threshing only, seem capable of such improvement as should encourage the inventors in trying to render them more complete.

The Committee think proper to suggest, that, in future, it will be well for those who offer articles of this kind, to have so much evidence of their merits, as to be able to state to the Trustees what can be performed by them, within a given time; whether it can be done in a way superiour to any present mode, and the labour necessary to work the machine. It is extremely difficult, if not impracticable, for the Trustees to satisfy themselves in these particulars, in the limited time allowed them at the show; and thus, unless such proofs are afforded by the inventor, some valuable inventions may not receive the attention they deserve.

That the ploughs presented were all of the common kinds, now in use, excepting the one offered by Mr. Jonathan Allen, of New Bedford. This being a patent machine, does not come within the bounty of the Society; but from examination, and from the remarks of several gentlemen who have used it, the Committee feel it to be their duty to recommend it.

That a cutting machine, offered by Alpheus Bigelow, Esq. of Weston, is very ingeniously contrived, is not expensive, considering its power, and, in the judgment of the Committee, deserves to be recommended for general use; but, as it is not an article enumerated for premium, and as the principle on which it operates, is similar to the English straw cutter, no further notice can, with propriety, be taken of it by the Trustees.

That of the drilling machines no one has been offered, which, in the opinion of the Committee, is superiour to those now in use.

That, with respect to the apparatus of Mr. Luke Johnson, to facilitate ploughing, by the use of a pair of wheels, it is understood to be a patent machine, and, therefore, whatever may be its merits, not entitled to a premium from the Society.

A particular description of this method of ploughing, and of the apparatus itself, may be seen in the last publication of the Society; where it is mentioned with approbation, by those who have made trial of it, and were competent judges of its merit.

P. C. BROOKS, *Chairman.*

The Committee on Agricultural Experiments report, That Erastus Ware of Salem, is entitled to the premium of \$ 40 for a crop of carrots, raised on one acre of ground, and

weighing 376 cwt. gross weight, equal to 752 bushels, at the usual estimate of 56 lb. to the bushel.

That Thomas Melvill, Esq. of Boston, is entitled to the premium of \$ 40 for a crop of turnips, of at least 720 bushels, raised on his farm in Pittsfield, under the management of his son, Mr. Thomas Melvill, Jr., on one acre of land.

That the Hon. James Richardson of Dedham, is entitled to the premium of \$ 40 for the best crop of potatoes, being 402 bushels on one acre of ground, in Dedham. The Committee award this premium with more satisfaction from the consideration, that the land, on which the potatoes grew, was a mere swamp in 1815, and that the labour and expense in making it thus productive, were comparatively small. There are few farmers who have not land of this kind, now wholly unproductive, which might, by draining and clearing, be rendered very valuable, and that without much expense. No part of a farm deserves more attention than bogs or meadows, which, though in their natural state of little or no value, may easily be made to produce the most abundant crops of the best grasses; and, being once reclaimed, will require less care than any other land.

That Mr. Jacob Rice of Shrewsbury, is entitled to the premium of \$ 40 for a crop of spring wheat, raised from two bushels of seed, being 36 1-16 bushels on one acre and four rods of land, equal to 35 bushels to the acre.

Mr. Jonathan Allen of Pittsfield, was a competitor for the premium on wheat. The sample of his grain was of a superiour quality, and his mode of culture worthy of imitation. He *estimates* his crop, from having threshed about one sixth part of his sheaves, at 63 bushels on one acre and 136 rods, equal to 34 bushels to the acre, having sowed four bushels of seed. This is a little short of Mr. Rice's quantity, but had it been equal, the Trustees would have felt themselves bound to give the premium to Mr. Rice,

because *his* quantity was ascertained by threshing and measuring *the whole*. Whatever may be said in favour of taking an estimate of the crop from gathering a part, as respects carrots and turnips, which it may not be expedient wholly to gather at this season of the year when they are supposed to be growing, the same cannot be said of wheat, which must have been reaped for sometime, and therefore, as to this article, *all conjecture* as to quantity is inadmissible.

The Committee regret, that there should have been so little competition in the articles of turnips, carrots, and wheat, all of them articles easily raised, and of great importance to the agriculturalist. For turnips there was but one claimant; for an acre of carrots but one, and for wheat only two. It cannot be that numerous crops of all these were not raised in this state the present year, and it would have been pleasing to the Trustees to have had them brought forward, if it were only to cause an excitement, and awaken the attention of our husbandmen. It is a leading object of this annual exhibition, to bring into general notice, and to recommend the most valuable products of our country, and to furnish information of the best modes of culture. The Committee, however, take pleasure in noticing the efforts of several persons in raising potatoes, a vegetable of which it is not, perhaps, too much to say, that it is at once the most useful and profitable of any with which we are acquainted. Nathaniel Ingersoll and E. H. Derby, Esquires, presented proofs of very abundant crops of this article, nearly equal to the one which gained the prize, and the mode of raising them was such as might easily be adopted by every farmer. The statement of Mr. Ingersoll may be further useful in showing, so far as his experiment went, the inefficacy of plaster of Paris as a manure for potatoes, *when put into the hill at the time of planting*. He planted several rows with the

plaster as a manure, and several without any *manure* at all, and could perceive no difference in the crop. Adjoining these he planted with manure, in the usual way, and the produce was so great as to induce him to contend for the premium. This experiment, however, will not, it is hoped, discourage the use of the plaster. Used as a *top dressing* for clover and grain crops, in different stages of their growth, it ought, perhaps, from various trials in this state, to be strongly recommended. Many farmers, also, it is understood, have had excellent crops of potatoes, using the plaster at planting, though Mr. Ingersoll's experiment failed.

P. C. BROOKS, *Chairman.*

Observing a premium offered by the Agricultural Society for the best crop of carrots, I was induced to give a statement of a crop raised in South Salem, upon a piece of land of a dark loamy soil, of a good depth, and not apt to suffer either from wet or dry weather, for their approbation. The land, after being well dressed with about four cords* of good stable manure, carted into heap in December, and shovelled over in the spring, as soon as the frost would admit; was then ploughed three different times, to the depth of about nine or ten inches, and harrowed between each ploughing, which brought the lumps upon the top, which were broken by drawing over a drag with weight upon it sufficient for one yoke of oxen, and, lastly, harrowed with a brush harrow. The ground being thus prepared, it was sown on the fourteenth of May, by one man in one day, with a drill, in rows about sixteen inches apart. About one third of the piece was then sowed with raddishes, in

* Said by Mr. Ware to be nine or ten buck loads, of thirty bushels each.

rows about two inches from the carrots, which, although late, sold in the market for about thirty dollars. They were wed three times, and, at the same time thinned, after being hoed between the rows; the labour of which, from sowing to digging, might be estimated at about twenty days. There was, likewise, taken from the same piece, a constant supply for the market, which might at least amount to one ton.

ERASTUS WARE.

We, the subscribers, Erastus Ware, the owner, and Horace Ware, a hired labourer, declare, that twenty-one loads of carrots, weighing three hundred and seventy-six gross hundreds, were dug on the one acre of land surveyed by Abijah Northes and Robert Peele, and that the mode of culture herein stated is true.

ERASTUS WARE,
HORACE WARE.

Sworn before me, at Brighton, this fourteenth day of October, A. D. 1817.

J. PRINCE, } Justice of the Peace, throughout the
Commonwealth.

MODE OF CULTIVATING AN ACRE OF TURNIPS ON THE
MELVILL FARM, IN PITTSFIELD, 1817.

PERSUADED that the opinion prevalent in this part of the country, relative to the culture of turnips, was erroneous, that with little more expense than on a potatoe crop, an acre of *old improved land* could be made, as in Europe, to produce a much greater quantity, than by the usual method of raising them on new land recently burnt over, or on bog land, I determined, in the spring, to appro-

priate an acre on the farm belonging to my father, and under my care, to this experiment.

For this purpose, I selected a piece from a lot, probably one of the first cleared on the farm, and has certainly been (from what I could learn from the neighbours) as often under tillage as any other piece on it, and quite impoverished. The soil is a gravelly loam. In 1813 it was sowed to grain and stocked; in 1814 and 1815, mowed; in 1816, half to potatoes, (manured in the hill) the other half plastered and mowed.

On the 20th of May, 1817, ploughed up of the potatoe ground and the sward (half an acre of each) and harrowed well, twice. In this state the land remained until the 20th of June, when we formed it into drills with the plough, each drill about 23 inches apart, thus making 53 drills in the length of the piece, from north to south.

The next day carried on 14 loads of hog manure, seven loads of common barn manure, and seven loads of sheep manure, and spread it immediately on the tops of the drills; the same day sowed the turnip seed (of the common kind used in this vicinity) on the top of the manure, and rolled it in. The following day, we sowed on 30 bushels of *slacked* lime, and 15 bushels of ashes, and, the better to extend the experiment, we divided these top dressings equally, on the different kinds of manure, so as to ascertain which manure, and which top dressing is best suited to turnips. Still farther to extend the experiment, we left about two square rods without manure, or top dressing, and marked off three drills not to be hoed out at all.

In a few days we had the satisfaction to see, that our seed had taken well. At first, that part with sheep manure appeared the best and most rank, whilst that without manure could hardly be perceived. On the 10th of July, harrowed between the drills with a common corn harrow, to extirpate weeds and loosen the soil. On the 15th July, examined the field again, no appearance of worms, the drills

with sheep manure and ashes continued the most promising; those with hog manure and ashes, the next. At this time we hoed out, with a small hoe, about five or six inches wide (well steeled and sharp on sides and face) so as to leave but one plant every four or five inches.

After this first hoeing, the drills, with hog manure and ashes, took the lead; those without manure or top dressing, and those not hoed, very diminutive in comparison.

The 21st July harrowed a second time between the drills, and the 26th July hoed out the field a second and last time. The 1st August began to thin out by hand, at which time the general size was from 2 1-2 to 3 1-2 inches (excepting the drills without manure, &c. and those not hoed). We have since continued every few days to thin out by hand, to feed out to the stock, and have thus used 63 bushels. We give them (with the tops) *raw*, to horned cattle, and boiled or steamed to milch cows, horses, and hogs; (for the latter, we mix a small quantity of ground oats, or buck wheat, or bran.) At first, hogs are not fond of them, but soon like them, especially when mixed half potatoes and half turnips.

In the cultivation of turnips in this manner, there would be considerable saving in the expense, to those who possess a drill plough and harrow, and the crop would probably be better, as the land would be more expeditiously, as well as better cleared. In the present instance, we used only such tools as we had at hand. For drilling in the seed, I could think of nothing more suitable than the tin tunnel (common in all farmers' houses) used for filling sausages, on the top of which, I tied a parchment cover, and made three holes in it; the nose of it serves for a handle, and experience proved, that with its aid we drilled *even*.

The tops of the turnips produced on such an acre may be estimated to afford as much nutritive food for horned cattle, as an acre of *common natural upland grass land*, and cattle are very fond of them. The land on which

these turnips were raised, did not produce, when in grass, over a *ton of hay* in common seasons; it has now produced at least *eight hundred bushels of turnips*, (and which are yet increasing in size) the average weight of which is forty pounds the bushel, or about 15 tons, besides the tops; and this, with an expenditure of \$ 17 75.

The result of this experiment proves, that the old received opinion (in this neighbourhood at least) relative to raising turnips, is erroneous, and will, I hope, induce many of my brother farmers to give it a fair trial, by turning some of their *old natural grass lands* into turnip fields, which, by producing so much more feed (and better for cattle) will enable them to fat them easier and cheaper, to keep a greater number of them, besides, the incalculable advantage of putting land in good heart for grain, and especially wheat, and a regular rotation of crops, on true agricultural principles.

THOMAS MELVILL, JR.

EXPENSES OF CULTIVATING THE FOREGOING ACRE OF
TURNIPS.

One day ploughing and harrowing	-	-	-	-	-	-	\$ 2
Half a day drilling	-	-	-	-	-	-	1
Getting out manure	-	-	-	-	-	-	3 50
Spreading do.	-	-	-	-	-	-	1
Seed-rolling	-	-	-	-	-	-	50
15 bushels unslacked lime	-	-	-	-	-	-	3
15 do. ashes	-	-	-	-	-	-	1
Sowing lime and ashes	-	-	-	-	-	-	25
Harroving between the drills	-	-	-	-	-	-	50
Hoing and clearing, man and boy	-	-	-	-	-	-	2 50
Harroving drills, 2d time	-	-	-	-	-	-	50
Hoing and clearing, 2d time	-	-	-	-	-	-	2

17 75

The expense of harvesting cannot be estimated, as they are yet in the ground ; but cannot exceed that of potatoes.

We have put in this year ten acres of potatoes, in no stage of the cultivation of which have we used a hoe, and they are as thriving as those cultivated in the common and expensive method of hoeing.

Dedham, October 13, 1817.

[To the Chairman of the Trustees of the Massachusetts Agricultural Society.]

DEAR SIR,

I have been urged, and have concluded, without any previous expectation of doing it, to make application for the premium for the culture of potatoes, presuming it probable that other crops may have exceeded mine, but, believing the instances rare, considering the cultivation.

In the autumn of the year 1815, I cleared and drained a piece of swamp land, containing about three acres, from which had been cut a heavy growth of pine, bendock, maple, and black birch wood, before the land fell into my hands. It was covered with sprouts from the stumps, large bushes, and brakes, and was very full of hassocks, between which the water stood generally during the summer. On a square of this land, after it was cleared of stumps, roots, and hassocks in part, and drained, I made the following experiment:—The square contains, by admeasurement, 139 1-2 square rods, and, in the spring of the year 1816, I had it broken up by Stephen Farrington, a poor, but industrious man in my neighbourhood, and committed it entirely to his care. The last year, it was planted about the second week in June, having been dug up with the spade and hassock hoe, but no manure applied, except a small quantity of coarse dry hay in each hill, and was indifferently attended to. The produce considerably

exceeded two hundred bushels of potatoes; but they were not accurately measured. The present year, the same piece was again planted with potatoes, and moderately manured with coarse stable and hog manure in the hill. It was hoed but twice, though I think well hoed. The potatoes have been dug, and carefully measured, and the produce of the piece, according to the certificates accompanying this communication, of the correctness of which I have no doubt, is three hundred and seventy-one bushels.

If others have exceeded this, it may not be on the same kind of land, or under the same mode of cultivation, and, therefore, this communication may not be wholly useless to the Society. I had no thought, till within a few days, of making this communication; and the whole cultivation was carried on, rather with reference to economy in labour and manure, than to largeness of crop.

I am, very respectfully, dear Sir,
your most obedient servant,

JAMES RICHARDSON.

Dedham, October 15, 1817.

HON. P. C. BROOKS,

DEAR SIR,

I have had an admeasurement of my potatoe ground adjoining the other, and the quantity of potatoes produced thereon, and enclose the certificates.

On the subject of the other queries in your note of yesterday, I have obtained more exact information than I expected.

“The original appearance of the ground before I meddled with it,” was, that of a dead swamp, after the wood had been cut off, for, say, from six to ten years, full of roots and stumps, from some of which, shoots had sprung up, and were from three to six inches through at the

ground; alders, white bush, and other bushes were intermixed, and, in the intervals, large clumps of the tall swamp brake and hassock grass.

In the autumn of 1815, the lot surveyed was cleared of the brush, stumps, roots, and large hassocks for the fuel, and it was estimated, that 100 ox cart loads of roots and stumps were taken from it. The proportion of ditching to this part of the meadow cost somewhat short of ten dollars.

In the spring of 1816, the piece was dug up with the spade and croame, and cost six days labour of one man; the digging the holes and planting, about four days labour for one man; the hoeing that year cannot be so exactly stated, as it was done at jobs, and somewhat neglected.

In the spring of 1817, the land being in the state it was left on digging the potatoes the fall before, no tool or utensil was used upon it, but the common broad hoe, except that it was, as the farmers term it, "furrowed one way" with a horse plough; the manure applied was about three cords, short of that, rather than over, and of a coarse kind; the furrows were drawn from three to three and an half feet apart, and the hills, the other way, were nearer together, say from two and an half to three feet, and in covering the potatoes, nearly all the soil between the hills was stirred; the quantity of seed was about ten bushels; the potatoes were cut, and generally three pieces, not exceeding in weight a good middling sized potatoe, put in each hill; not less than six, nor more than eight hills were required to produce a bushel of potatoes through the whole piece.

The same facts are generally true with regard to the small piece now added, except that a little larger quantity of manure was applied, and the hills considerably further apart.

This land is part of a basin of about three acres, at the lower part of which, two knolls so nearly meet, that the

pan is about fifteen inches below the surface, and the surface in the basin about fifteen inches above the surface of the meadow below; depth of the soil in the basin is from four to six feet, and appears to be composed principally of decayed vegetable substances. Another square of an acre adjoining this, was, on the 25th of April, 1816, sowed with herds' grass and red top; when three months and an half from the seed, August the 10th, it was mown, and at least 25 cwt. of hay taken from it; a great part of the herds' grass was in blossom, and some of it more than four feet high by measure; the present season, I cut more than two tons from this acre of herds' grass and red top, clear from any coarse meadow grasses or weeds. On this square no manure has ever been put. The surface, I should have mentioned, was pared, and the hassocks, and coarse grass, and brake roots burned, and the seed raked in with iron rakes.

This last paragraph, I am sensible, is foreign from your inquiries, but may not be wholly useless.

I am, very respectfully, Sir,
your most obedient servant,

JAMES RICHARDSON.

Dedham, October 15, 1817.

We hereby certify, that we have measured the part of a piece of land belonging to James Richardson, from which the potatoes have been dug, and which is in the same lot with a piece cultivated by Stephen Farrington, and separated from that by a ditch, and find it to contain twenty-one square rods, and one hundred and fifty-three square links.

MARTIN MARSH,
JOHN GUILD.

Dedham, October 15, 1817.

I hereby certify, that I dug the potatoes from the above land, and measured them, and found them to measure thirty-one bushels and a peck.

JOHN FISK.

[To the President of the Massachusetts Agricultural Society.]

This certifies, that on the eighth day of October instant, I surveyed a wheat field belonging to Captain Jacob Rice, of this town, and found the same to contain one acre and four rods, and no more.

VASHNI HEMENWAY, *Surveyor.*

Town of Shrewsbury, in the county of Worcester, and Commonwealth of Massachusetts, October 10th, 1817. This day, personally appeared Vashni Hemenway, Esq. and made oath to the truth of the facts contained in the certificate by him above subscribed before me.

ANDREW H. WARD, *Justice Peace.*

I, Jacob Rice of Shrewsbury, in the county of Worcester, and Commonwealth of Massachusetts, do certify and say, that on the ground abovementioned, surveyed by V. Hemenway, Esq., I raised, the present season, thirty-six bushels and two quarts of wheat, and that, in my opinion, the wheat on nearly, or quite four rods of the above mentioned field, had, previous to harvesting, been destroyed by the fowls. The quantity of seed sown was two bushels. The nature of the soil and manner of cultivation of the said ground, and preparation of the seed of the said wheat previous to the same being sowed, was as follows, to wit:—The said field is situated on a long hill, or swell of land,

the field descending to the northwest. The soil is strong, but not uncommonly loamy, containing some fast, and many small loose stones. Indian corn was raised on the above field, during the years 1815 and 1816. In 1815, the corn was manured in the hill only, and the next year there were spread at large over the ground before planting it with corn, about twenty-five loads of green heap manure. In the spring of the present year, I ploughed the said ground the first time, by splitting the hills with two furrows in a row; then cross ploughed the same, and harrowed it smooth. In the new of the moon in April, I think the 23d, I sowed the seed of said wheat, and, after ploughing it in, drew a bush over the field. The seed was prepared as follows:—The seed was put to soak in brine as strong as salt would make it, and to which was added one ounce of blue vitriol; after remaining in this pickle twenty hours, the seed was taken out and rolled in plaster of paris until the kernels would easily separate from each other, and in this state it was sown. The above mentioned field is not newly cleared land, but has been tilled many years, and occasionally laid down to grass.

JACOB RICE.

Worcester, ss. town of Shrewsbury, October 11, 1817.
This day personally appeared Jacob Rice, above named, and made oath to the truth of all the facts set forth in the above statement, by him subscribed before me.

ANDREW H. WARD, *Justice Peace.*

REMARKABLE INSTANCE OF EXPEDITION IN THE MANUFACTURE OF MOROCCO LEATHER.

[Although the Trustees of the Massachusetts Agricultural Society had not extended their premiums to the manufacture of leather, yet they received with great pleasure and interest the specimen

alluded to in the affidavit herein after inserted, as an example of skill and despatch, which may be considered as almost unheard of. In fourteen hours from the time the goat therein mentioned was alive, a perfect, and indeed, beautiful pair of women's shoes was presented to the society, manufactured from his skin. The fabrick appeared to be in all respects perfect, and not distinguishable from that of the best imported shoes. We have thought it only necessary to insert Major Furnald's affidavit, because it is full and satisfactory, and his character is so respectable as to require no further support in confirmation of his statement. The Society, however, possess five other affidavits corroborating his account.

Major Samuel Jaques, member of the Agricultural Society of Massachusetts, having intimated to the subscriber, that a specimen of morocco leather, from our manufactory at Charlestown, would be desirable for the intended exhibition at Brighton; and, considering that the manufactory of that article in this country was generally known to be equal in quality to any imported, it remained only to shew the practical skill of the workmen by the celerity of the work: with this view I procured a healthy goat, and, on the morning of the fourteenth instant, between the hours of twelve and one o'clock, I had him slaughtered, and the skin delivered to my workmen; the limeing, cleansing, and tanning was performed by Joseph Nichols between ten and eleven; the shaving in a few minutes by Thomas Barker, and the colouring and finishing into black morocco leather complete by Henry Munroe, before one o'clock. The leather was sent to Eliot Perkins, in whose shop a pair of women's shoes was made from the same skin, and delivered to me at half past two o'clock, with which I proceeded to Brighton on the day of exhibition. I personally attended, through the whole process of working the skin, and partly during the making of the shoes.

WILLIAM FURNALD.

Charlestown, October 16, 1817

Middlesex, ss. October 16, 1817. Then the above named William Furnald personally appeared, and made solemn oath to the truth of the foregoing declaration, by him subscribed before me.

JOHN SOLEY, *Justice Peace.*

REMARKS ON THE GRADUAL DIMINUTION OF THE FORESTS OF MASSACHUSETTS, AND THE IMPORTANCE OF AN EARLY ATTENTION TO SOME EFFECTUAL REMEDY. WITH EXTRACTS FROM THE WORK OF M. MICHAUX ON THE FOREST TREES OF NORTH AMERICA.

[By John Lowell.]

Roxbury, November 18, 1817.

THERE is no subject connected with agriculture, which more earnestly engages the attention of the governments and people of Great Britain, and France, and indeed of most other European nations, than the preservation, growth, and increase of their forests. Experience has taught them their value, and the great care which they require to keep up the quantity necessary for the consumption of those populous countries. If the island of Great Britain had not been blessed with a mineral (the sea coal) which supplies for the most important purposes of comfort and manufactures the want of wood, it would be extremely difficult to conceive in what manner the people of Great Britain would have been able to have furnished themselves even with fuel for their houses; and it is perfectly certain, that they never could have procured a sufficient supply for their extensive manufactories. The steam engine, which has been the means of advancing the prosperity of that nation almost beyond the possibility of conception, would have

been for *them*, at least, almost an useless discovery; and there is scarcely any nation which would not have enjoyed advantages superiour to the inhabitants of Great Britain, in the application of that wonderful auxiliary to human labour.

In order to have furnished a supply of wood for the consumption of their manufactories, vast tracts of land which have been employed in raising food for men and animals must have been converted into forests, and thus, it is obvious, a much smaller population could have been supported in these islands. In France, though considerable bodies of mineral coal have been discovered in some parts of that extensive kingdom, yet it is not found in sufficient quantities, nor so readily within the reach of the inhabitants, as to supply in any considerable degree the want of wood, either for manufactories or domestick consumption. Wood is in France the principal fuel for every purpose, either in its natural form, or in that of charcoal; the use of which is much more extensive than with us, because it is believed to be a more economical mode of using wood, and it is certainly much the most saving form in which it can be transported. In England, with certain exceptions as to large timber, which the government has a right to reserve for the purposes of the navy, the management of the woods and forests is left entirely to individual interest and intelligence. But in France the whole forests and woods of the kingdom, whether publick or private property, are subjected to a regime or system of management, which is a very considerable restraint on private rights. So important, nay, so vital an interest have the French people considered the preservation of wood, that they have submitted to the most rigid system of inspection for the publick good. No individual can cut down an acre of wood without the permission of government, and that permission is by law clogged with conditions with which the proprietor must comply. I do not mean to recommend such a system here, nor am I per-

suaded, that individual interest will not be a sufficient protection to the forests of any country, but still it may be of some consequence to lay the facts before the publick.

In France, great and extensive publick forests were sacredly preserved, even during the period of the revolution, when almost every thing else was abandoned to destruction. By the system of management which now prevails, it is computed, that the forests of France, and the supplies which they furnish, will never diminish, and that there will be always sufficient for domestick consumption, as fuel, as well as for architectural and naval purposes. It is not extraordinary, that the early settlers of our country, finding the forests the most immediate obstructions to cultivation, and their removal and extirpation the heaviest expense in their first settlements, should have waged indiscriminate war upon the woods, and thought very little of the effects of this destructive spirit upon their posterity. Men, pressed by famine, and coming to a new and savage country with the motives, views, and feelings of our ancestors, could not be expected to take a very liberal care of the interests of future generations. Still less could it be expected, that the indefatigable, but poor settlers of New England should have been convinced of the less obvious truth, that pecuniary interest and taste combined to enforce the policy of a limited and judicious destruction of the native growths.

The cost and expense of clearing our lands, compared with their value after they were cleared, and the difficulty of eradicating completely the after growth, were so great, and the forests themselves appeared so vast in proportion to any probable demand for fuel, and wood for building and other purposes, that no man dreamt that the day would arrive, in which his descendants might regret the improvident profusion of their ancestors. Hence there seems to have been a sort of hatred, an indescribable prejudice to trees, especially round their dwellings. An exception,

perhaps, ought to be made in favour of some counties, in which a little degree of mercy was exercised towards our native elms, which were permitted to retain a parsimonious possession of the waste lands of our publick roads, where they exhibit a melancholy sample of the beauty of our native forests.

The above causes alone can account for the fact, that in this climate, where the summer months are so hot, compared to the climate of Europe, and where the clearness of the sky seems to render shade so much more important, we find such a general war waged upon trees in the vicinity of dwelling houses.

The Trustees of the Massachusetts Agricultural Society, impressed with these ideas, and alarmed at the constant increase of the price of fuel, have, for twenty years past, by offering premiums for planting, and by remarks in their periodical publications, endeavoured to call the attention of the farmers of this state to this important subject. It is remarkable, that but one premium for planting, during this period, has been claimed or granted. Perhaps there was one defect in the form in which the premium was offered. It was confined to those who should raise the greatest number of trees, not less than 2000, *from seed*. There seems to be no good reason for this limitation; on the contrary, the experience of European farmers and cultivators would seem to authorize a preference for planting. The great obstacle to the latter mode, in our country, is the defect of extensive nurseries. Land must be uncommonly well prepared, and, for a long succession of years, watched and cultivated, in order to raise trees from seed. The best mode of raising forest trees in great quantities, is unquestionably that which has been adopted in Europe. Forest trees, though so hardy and vigorous after they have attained a certain size, are remarkably tender in their early growth. They require the aid of professional men and skilful gardeners; and it is well known, that one or more transplantations, before they are finally planted out,

is requisite to give them that vigour and abundance of small roots, which are necessary to their success.

The practice of transplanting trees from our forests, of six or ten years growth, robbed as they must be of the greater portion of their fibrous roots, and suddenly exposed to a soil and air, to which they have been unaccustomed, cannot be too much reprobated. The only thing which can be urged in its favour, is the necessity of the case, our nurseries not furnishing stocks in sufficient quantities for any considerable experiment. It is however true, that it would be cheaper for an American cultivator, who should be disposed to cover several acres with forest trees, to import plants of two or three years of age from Europe, than to attempt to effect the same object by planting acorns, walnuts, or sowing the seeds of other plants in the spot in which they are intended to grow, and watching them during their feeble state. Still more true is it, that such an importation would be cheaper than to attempt to introduce the sickly and mutilated plants from the native forest into new grounds prepared for this purpose. A thousand healthy young trees may be imported from Europe, and planted out at less expense than that at which 100 could be removed from a neighbouring forest, into a new plantation.* This remark is the result of much experience. I would not be understood to recommend the use of the European nurseries to the exclusion of our own. I would rather excite an attention in cultivators of opulence to the formation of nurseries, and of all our farmers to the encouragement of nurserymen. The employment ought to be distinct from that of a farmer. It requires peculiar skill and talent, and should be encouraged. It is a mortifying truth, that the inhabitants of Massachusetts import seven eighths of their fruit trees, and most of their ornamental forest trees, from New York. I would not quarrel with this state of things, if I did not believe that it has been in

* Taking into view the proportion which would finally succeed.

part owing to a want of attention to a very interesting subject.

What the Agricultural Society has failed to do by its premiums, has been in part effected by individual taste. The Hon. Mr. Gore led the way, which others have followed, in the formation of plantations designed principally for ornament. Farmers may, perhaps, be disposed to treat with levity these efforts to adorn our country, but in truth if they knew the interesting and important effects of this taste in Great Britain, they would very materially change their opinions. Every one, acquainted with letters, recollects the sarcastick sneers of Dr. Johnson upon the barren and naked appearance of Scotland, and every man who has visited it of late years is equally convinced, that to the prevalent taste for planting around their houses, and along the publick roads, Scotland, and even England are indebted, not only for an interesting improvement in the landscape and the picturesque views of the country, but for an important increase in the materials destined for fuel and architecture.

The further explanation of these ideas will, for the purpose of soliciting and managing the patience of our readers, be postponed to the next number; and, in the mean time, some interesting extracts will be made from the work of Monsieur Michaux, the younger, who has the merit, though a foreigner, of having given the *first* history of the forest trees of our country, which combines science with utility. Monsieur Michaux, in his introduction to his Treatise on the Forest Trees of North America, justly remarks, that although many learned naturalists had described the vegetable productions of North America, yet it had been with a view to the advancement of science, rather than to promote the knowledge of the properties of plants, or to make known the uses to which the American wood, of various sorts, may be applied in the arts. The chief object of Monsieur Michaux was to supply this defect. For this

purpose he made two voyages to America; one in 1802, the latter in 1806. This last was in the employment of the French government, and under the orders of the administration of French forests. The present work is the result of his labours. He sent home the seeds of almost all our trees, which have abundantly succeeded. It is not improbable, unless we can be roused to more attention to this subject, that in fifty years France will be able (as Great Britain can at this day) to shew American trees of better and fairer growths, than America itself can commonly and easily exhibit.

Indeed it is not improbable, that before that time we shall experience not only an increase of price, but actual difficulty in procuring the wood suitable for naval architecture, the quantity required for which is much greater than is generally conceived. If, as has been stated, a ship of the line requires all the good wood which can be usually found on fifty acres of well wooded land, the whole present navigation of the United States must have consumed thirty thousand acres of wood, which consumption is renewed every ten years. But, as there are but few sorts of trees which can be applied to naval architecture, and the best parts alone of those can be used, and as those woods only can be so applied which are on the coasts or banks of navigable rivers, or very near to them, it will be seen, that there is great danger that the supply will not equal the demand, unless attention be paid to the preservation of the old, and the cultivation of new forests or woods.

America is more favoured, says Monsieur Michaux, in the variety of her forest trees than France. The number of sorts of American forest trees, whose growth amounts to thirty feet at least, which Monsieur Michaux describes, is 137, of which ninety-five are employed in *the arts*.

In France, there are only thirty-seven which grow to that size, of which eighteen only are found in their forests, and seven only of these are employed in civil and maritime architecture.

This difference, so favourable to our country, must excite surprise, and the more so, because the climate of France is very various, its soil good, and its forests very extensive. The fact thus established, ought to teach us the value of our treasures, and the importance of preserving them. Monsieur Michaux explored, as a botanist and indefatigable inquirer, our whole country, from Maine to Georgia. Along the Kennebeck and Sandy rivers, from Boston to Lake Champlain, through New Hampshire and Vermont; from New York to Lakes Erie and Ontario; from Philadelphia to the banks of the Monongahela, Alleghany, and Ohio; and from Charleston, South Carolina, to the sources of the rivers Savannah and Oconee. So much has a foreigner, at the expense of a foreign nation, done in our country for the discovery of the means of improving its forests.

Monsieur Michaux says, that the object of his voyage was to acquire an intimate knowledge of the most interesting trees of America, of those which were the most useful, either for combustion or different sorts of building. He adds, that he shall suggest the manner in which the American forests ought to be managed, by pointing out the sorts which ought to be favoured, and those which should be destroyed; for in his judgment a bad tree ought never to be suffered to grow in a place which might produce a better; and in no country does he think this choice more important than in America, for reasons which he does not assign. He says, he should not hesitate to allege, that of two collections of forest trees, situated in the same district and of equal extent, the one from which the bad sorts should have been taken away, would, whenever the whole wood should be cut down, be worth fifty per cent. more than the other. He must intend to say, after a lapse of some years. There can be no doubt of this truth. By the removal of the unprofitable and ordinary species of trees, the others would have room to expand, and their

growth would not only be promoted, but the quality of the wood itself improved. Monsieur Michaux also proposes to point out the sorts of European trees, which we may advantageously introduce in our forests. He says, it cannot be denied, that the European nations have one advantage over us. They have reserved large forests on national account; whereas, in America, neither the national government, or those of the several states, have made any such reservations with such views. Hence has resulted a dreadful destruction, he remarks, and one which will continually increase with the population. Already the effects are severely felt in the large towns, not only in the enhanced price of wood, but even in the difficulty of procuring wood of the best sorts for constructing buildings and ships, and various other uses. In a few years, he thinks, we shall scarcely be able to find a single live oak, so precious in naval architecture. Monsieur Michaux remarks on the singular confusion which prevails in our country, in the popular or common names of our forest trees. "The same species receives almost always different denominations in different districts; frequently, also, the same name is given to species *very distinct*, and very often indeed three or four different names are given to the same tree in the same district." This is a fact well known to every man of any observation, and is of serious inconvenience. It introduces a confusion into conversation, and even into contracts, which is very inconvenient. I shall cite one example, out of twenty, which have occurred to myself. A carpenter recommended juniper posts, as the best with which he was acquainted for durability. I, at first, supposed he had got the true name of the red cedar, and asked him, if he intended that tree. "No; he meant the juniper, which was obtained in New Hampshire, and came down the Middlesex canal, a close grained, hard, and heavy wood." I presume we should never have understood each other, if he had not recollected, that he had seen it in a new plan-

tation on my estate. On carrying me to the tree, I found it to be the larch, which I had known under the popular name of hackmatac.

Monsieur Michaux has done much towards remedying this evil, if it be susceptible of remedy, which is much to be doubted. He has collected all the common and vulgar names, except those which appeared to be very odd and extremely limited in their use. He has connected these vulgar names with the scientific one of each tree, and has also selected the popular name, which he thinks ought to be retained, discarding all the others. In choosing this, he has selected the name most usually given to the tree, in those parts of the United States where it is most abundant.

As this table will enable the farmers, and other citizens of the United States, to understand each other's language when talking of forest trees, and of the woods best adapted for various uses, and of the growths of tracts of uncultivated lands, I have thought it would make a very useful addition to our Journal, and a very proper introduction to Monsieur Michaux's remarks on the respective uses and qualities of our trees, and to some further suggestions which I propose to make, on the means of encouraging the rearing and planting of forest trees.

The table will, therefore, be inserted.

LIST OF THE FOREST TREES OF AMERICA, DESCRIBED IN THE WORK OF M. ANDRE F. MICHAUX, MEMBER OF THE PHILOSOPHICAL SOCIETY AT PHILADELPHIA, OF THE SOCIETIES OF AGRICULTURE OF CHARLESTON, SOUTH CAROLINA, OF HALLOWELL, OF THE DEPARTMENT OF THE SEINE AND OF THE SEINE AND OISE, AND OF THAT OF MASSACHUSETTS.

The first column points out the botanical name, and the American name which it is thought best to retain as being most general.

The second column contains the vulgar names in use, in the various parts of the United States and Canada.

Botanical and most common American name.	Vulgar names employed in various parts of the United States and Canada.
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Pinus Rubra, <i>Red Pine.</i>	<p>{ <i>Red Pine</i>, only name given to this tree in Canada; often used in Nova Scotia and New Brunswick, and in Maine.</p> <p>{ <i>Norway Pine</i>, name more generally in use for this tree than the above, in the District of Maine, New Hampshire, and Vermont, but less proper. It is not the Norway Pine, says Michaux.</p> <p>{ <i>Yellow Pine</i>, name sometimes given to it in Nova Scotia.</p> <p>{ <i>Pin Rouge</i>, or red pine in Canada. Michaux prefers red pine, as being more characteristick and distinct.</p>
Pinus Rupes- tris, <i>Grey Pine.</i>	<p>{ <i>Grey Pine</i>, in Canada, by the French and English.</p> <p>{ <i>Scrub Pine</i>, in Nova Scotia and Maine. Uncommon and ordinary. Michaux.</p>
Pinus Mitis, <i>Yellow Pine.</i>	<p>{ <i>Yellow Pine</i>, general name in all the middle states.</p> <p>{ <i>Short-leaved Pine</i>, in the southern states.</p> <p>{ <i>Spruce Pine</i>, a secondary name in these last mentioned states.</p>

This is described by Michaux as a pretty valuable tree, ranking after the red pine, which is again put far behind the long-leaved or pitch pine of the south, and the white pine of the north.

Pinus Inops, <i>Jersey Pine.</i>	<p>{ <i>Jersey Pine</i>, general name in New Jersey, where it abounds.</p> <p>{ <i>Scrub Pine</i>, the name given to it in Virginia, and in those parts of Pennsylvania where it is found.</p>
Pinus Pungens, <i>Table-mountain Pine.</i>	<p>{ <i>Table-mountain Pine</i>, the only name given to it in the neighbourhood of that mountain, in North Carolina.</p>

Botanical and most
common American
name.

Vulgar names employed in various parts of the United
States and Canada.

- Pinus Australis*,
*Long-leaved
Pine.* { *Yellow Pine.*
Long-leaved Pine.
Pitch Pine (not the pitch pine of the
north.)
Broom Pine, all which names are more
or less used in the lower parts of the
southern states, where alone this tree
grows.
Southern Pine and *Red Pine*, are the
names given to it in the middle and
northern states, by those who use it.
Georgia Pitch Pine, name given to it
in the West Indies, and in England.
- Pinus Serotina*,
Pond Pine. { *Pond Pine*, name given by M. Michaux
to this pine, which has none given to
it in the southern states, where he
found it.
- Pinus Rigida*,
Pitch Pine. { *Pitch Pine*, general name in all the
northern and middle states. This is
the true pitch pine of New England,
but very different from the pitch pine
of the south.
- Pinus Tæda*,
Loblolly Pine. { *Loblolly Pine*, only name in the south-
ern states.
White Pine, sometimes so called in the
neighbourhood of Petersburg, Vir-
ginia.
- Pinus Strobus*,
White Pine. { *White Pine*, only name given to this
tree in the greater part of the United
States, and in Nova Scotia and New
Brunswick.
Pumpkin Pine and *Sapling Pine*,
names sometimes given to it in Ver-
mont, New Hampshire, and Maine, in
reference to the quality of its wood.
Pin Blanc, or *White Pine*, by the Ca-
nadians. *Weymouth Pine*, in En-
gland.

Botanical and most
common American
name.

Vulgar names employed in various parts of the United
States and Canada.

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| <p><i>Abies Nigra</i>,
<i>Black Spruce</i>,
(<i>Double Spruce</i>.)</p> | <p>{ <i>Black</i>, or <i>Double Spruce</i>, name used
in the northern states, in Maine, and
Nova Scotia.
{ <i>Red Spruce</i>, in the same countries, hav-
ing regard, however, to trees of larger
size than usual, or to certain places of
growth. <i>Epinette noire</i>, in Canada.
<i>Sapinette noire</i>, in France.</p> |
| <p><i>Abies Alba</i>,
<i>White Spruce</i>.</p> | <p>{ <i>White</i>, or <i>Single Spruce</i>, names applied
in the northern states, and in Nova
Scotia. <i>Epinette blanche</i>, in Cana-
da. <i>Sapinette blanche</i>, in France.</p> |
| <p><i>Abies Canaden-
sis</i>,
<i>Hemlock Spruce</i>.</p> | <p>{ <i>Hemlock</i>, or <i>Hemlock Spruce</i>, only de-
nomination in use in all parts of the
United States, where this tree is
found. <i>Pêrusse</i>, by the Canadians.</p> |
| <p><i>Abies Balsam-
ifera</i>,
<i>Silver Fir</i>.</p> | <p>{ <i>Silver Fir</i>.
{ <i>Fir balsam</i>.
{ <i>Balm of Gilead</i>, all names equally ap-
plied to this tree in the northern parts
of the United States.</p> |
| <p><i>Juglans Nigra</i>,
<i>Black Walnut</i>.</p> | <p>{ <i>Black Walnut</i>, only name in the
southern and western states.
{ <i>Noyer Noir</i>, by the French of Canada
and Louisiana.</p> |
| <p><i>Juglans Cathar-
tica</i>,
<i>Butter Nut</i>.</p> | <p>{ <i>Butter Nut</i>, only name in New York,
and Virginia, and often applied in
the northern states.
{ <i>White Walnut</i>, name much in use in
Pennsylvania and Maryland.
{ <i>Oil Nut</i>, name applied in New Hamp-
shire, Massachusetts, Vermont, and
Connecticut.</p> |
| <p><i>Juglans Olivæ-
formis</i>,
<i>Pacane Nut</i>.</p> | <p>{ <i>Pacane Nut</i>, or <i>Pacancier</i>, name given
to this tree by the French of Louisi-
ana, and adopted by the Americans.</p> |
| <p><i>Juglans Amara</i>,
<i>Bitter Nut</i>
<i>Hickory</i>.</p> | <p>{ <i>Bitter Nut Hickory</i>, only name applied
to it in New York and New Jersey.
{ <i>White Hickory</i>, general name in Penn-
sylvania.
{ <i>Noyer Amer</i>, Canadian name.</p> |

Botanical and most common American name.	Vulgar names employed in various parts of the United States and Canada.
<i>Juglans aquatica</i> , <i>Water Bitter</i> <i>Nut Hickory.</i>	} <i>Water Bitter Nut</i> , name given to it by Michaux. It has no name in the southern states, where it grows.
<i>Juglans Tomen-</i> <i>tosa</i> , <i>Mockernut</i> <i>Hickory.</i>	} <i>Mockernut Hickory</i> , general name in New York and New Jersey. <i>Whiteheart Hickory</i> , name sometimes applied in those states. <i>Common Hickory</i> , applied in Pennsylvania, Maryland, and other southern states. <i>Noyer Dur</i> , by the French of the Illinois country.
<i>Juglans Squa-</i> <i>mosa</i> , <i>Shellbark Hick-</i> <i>ory.</i>	} <i>Shellbark Hickory</i> , name in most common use in the United States. <i>Shagbark Hickory</i> , name sometimes applied to the north of Connecticut river. <i>Kisky Thomas</i> , by the Dutch of New Jersey. <i>Noyer Tendre</i> , by the French of Illinois.

We think M. Michaux mistaken on this point. It is the common walnut of our tables, and is almost universally called *Shagbark*. In all the northern states, we know this tree by the name of walnut, and not hickory, which is a southern name.

<i>Juglans Lacini-</i> <i>osa</i> , <i>Thick-shell-bark</i> <i>Hickory.</i>	} <i>Thick-shell-bark Hickory</i> , name given to this tree in the western states, where it is confounded with the true shell, or shagbark. <i>Gloucesternut Hickory</i> , known under this name only in that part of Virginia. <i>Springfield Hickory</i> , another name given to this tree in the vicinity of Philadelphia.
<i>Juglans Porcina</i> , <i>Pignut Hickory.</i>	} <i>Pignut Hickory</i> , most common name in all parts of the United States. <i>Hognut Hickory</i> , more usual name in some districts of Pennsylvania.

Botanical and most common American name.	Vulgar names employed in various parts of the United States and Canada.
<i>Juglans Myristicæformis</i> , <i>Nutmeg Hickory-nut</i> .	<i>Nutmeg Hickory-nut</i> , name given to it by M. Michaux, it having no name in the southern states.
<i>Quercus Alba</i> , <i>White Oak</i> .	<i>White Oak</i> , general and unique name throughout the United States. <i>Chêneblanc</i> , by the Canadians.
<i>Quercus Muscosa</i> , <i>Mossy Cup Oak</i> .	<i>Mossy Cup Oak</i> , name given by M. Michaux to a species found in the Genessee country, and near Albany.
<i>Quercus Macrocarpa</i> , <i>Overcup White Oak</i> .	<i>Over-cup White Oak</i> , general name given to it in Kentucky and Tennessee.
<i>Quercus Obtusiloba</i> , <i>Post Oak</i> .	<i>Post Oak</i> , general name in both Carolinas, Georgia, and Tennessee. <i>Iron Oak</i> , secondary name in those countries. <i>Box Oak</i> and <i>Box White Oak</i> , name given to it in Maryland, and the parts of Virginia bordering on it.
<i>Quercus Lyrata</i> , <i>Overcup Oak</i> .	<i>Overcup Oak</i> and <i>Swamp-post Oak</i> , names equally used in the lower parts of the southern states. <i>Water-white Oak</i> , secondary name in the same places.
<i>Quercus Prinus Discolor</i> , <i>Swamp white Oak</i> .	<i>Swamp white Oak</i> , most common name in the northern and middle states. <i>Water-chesnut Oak</i> , Pennsylvania name.
<i>Quercus Prinus Palustris</i> , <i>Chesnut white Oak</i> .	<i>Chesnut white Oak</i> , name applied in the lower parts of Georgia, and the Carolinas. <i>White Oak</i> , peculiarly so called on the Savannah river. <i>Swamp-chesnut Oak</i> , secondary name in the same places.

Botanical and most
common American
name.

Vulgar names employed in various parts of the United
States and Canada.

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| <p><i>Quercus Prinus</i>
<i>Monticola</i>,
<i>Rock-chesnut</i>
<i>Oak</i>.</p> | } | <p><i>Rock-chesnut Oak</i>, only name given to this tree in New York and Vermont.
<i>Rock</i> and <i>Rocky Oak</i>, second name in the same countries.
<i>Chesnut Oak</i>, in Pennsylvania and Virginia.</p> |
| <p><i>Quercus Prinus</i>
<i>Acuminata</i>,
<i>Yellow Oak</i>.</p> | } | <p><i>Yellow Oak</i>, name given to this tree in the county of Lancaster, Pennsylvania.
No particular name given to it in other parts of the United States.</p> |
| <p><i>Quercus Prinus</i>
<i>Chinquapin</i>,
<i>Chinquapin</i>
<i>Oak</i>.</p> | } | <p><i>Chinquapin Oak</i>, name employed in the upper parts of Georgia, and the Carolinas.
<i>Small-chesnut Oak</i>, in New York and Pennsylvania.</p> |
| <p><i>Quercus Virens</i>,
<i>Live Oak</i>.</p> | } | <p><i>Live Oak</i>, only name in all the southern states; and also in the northern states, where the wood is only seen, but the tree is never found.</p> |
| <p><i>Quercus Phellos</i>,
<i>Willow Oak</i>.</p> | } | <p><i>Willow Oak</i>, only name in the southern states, and in Pennsylvania.</p> |
| <p><i>Quercus Imbricaria</i>,
<i>Laurel Oak</i>.</p> | } | <p><i>Laurel Oak</i>, secondary name in the states west of the Alleghany mountains.
<i>Black-jack Oak</i>, more common, but less proper name, because it is applied to another, for which it is kept distinct.
<i>Chêne à latte</i>, by the Illinois French.</p> |
| <p><i>Quercus Cinea</i>,
<i>Upland Willow</i>
<i>Oak</i>.</p> | } | <p><i>Barren's willow-Oak</i>, name given in the lower parts of the southern states.</p> |
| <p><i>Quercus Pumila</i>,
<i>Running Oak</i>.</p> | } | <p><i>Running Oak</i>, in the lower parts of the southern states.</p> |
| <p><i>Quercus Heterophylla</i>,
<i>Bartram's Oak</i>.</p> | } | <p><i>Bartram's Oak</i>, name given to an oak on Skuykill, near Philadelphia.</p> |

Botanical and most common American name.	Vulgar names employed in various parts of the United States and Canada.
<i>Quercus Aquatica</i> , <i>Water Oak</i> .	{ <i>Water Oak</i> , general name in Virginia, and in the southern states.
<i>Quercus Ferruginea</i> , <i>Black-jack Oak</i> .	{ <i>Black-jack Oak</i> , name in use in the southern states. <i>Barren's Oak</i> , name employed in Pennsylvania, New Jersey, and Delaware.
<i>Quercus Banisteri</i> , <i>Bear Oak</i> .	{ <i>Bear Oak</i> , name in New Jersey and New York. <i>Black Scrub Oak</i> , name used in the north of Connecticut river. <i>Scrub Oak</i> , in some parts of Pennsylvania and Virginia.
<i>Quercus Catisbœi</i> , <i>Barren's Scrub Oak</i> .	{ <i>Barren's Scrub Oak</i> , in the lower parts of the two Carolinas and Georgia.
<i>Quercus Falcata</i> , <i>Spanish Oak</i> .	{ <i>Spanish Oak</i> , only name in use in Pennsylvania, Maryland, and Virginia. <i>Red Oak</i> , in the lower parts of the southern states.
<i>Quercus Tinctoria</i> , <i>Black Oak</i> .	{ <i>Black Oak</i> , only name in the forests of the middle, western, and southern states. <i>Quercitron Oak</i> , name in commerce. <i>Chêne Noir</i> , by the Illinois French.
<i>Quercus Cocinea</i> , <i>Scarlet Oak</i> .	{ <i>Scarlet Oak</i> , name given by M. Michaux to a tree, which, in the middle states, bears the name of <i>Red Oak</i> , being confounded with a species hereafter mentioned.
<i>Quercus Ambigua</i> , <i>Grey Oak</i> .	{ <i>Grey Oak</i> , only name given to this species in New Hampshire and Vermont, as well as in the District of Maine, New Brunswick, and Nova Scotia.

Botanical and most
common American
name.

Vulgar names employed in various parts of the United
States and Canada.

Quercus Palustris,
Pine Oak. { *Pine Oak*, name given to this species
in New York and New Jersey.
Swamp Spanish Oak, in Pennsylvania
and Maryland.

Quercus Rubra,
Red Oak. { *Red Oak*, name given to this oak in all
the northern and middle states.

In all 27 species of oaks.

Betula Papyracea,
Canoe Birch. { *Canoe and Paper Birch*, names equally
used in New Hampshire, Vermont,
District of Maine, Nova Scotia, and
further north.
White Birch, name also equally applied
in the same countries.
Bouleau à Canot, by the French in
Canada.

Betula populifolia,
White Birch. { *White Birch*, general name in the
northern and middle states.
Old-field Birch.

Betula Rubra,
Red Birch. { *Red Birch*, so called in New Jersey
and some parts of Pennsylvania.
Broom Birch, secondary name in Penn-
sylvania.
Birch, in the southern states.

Betula Lenta,
Black Birch. { *Black Birch*, denomination applied to
it in the northern and middle states.
Cherry Birch, secondary name in some
parts of the northern states.
Sweet Birch, in the middle states.
Mountain Mahogany, in a part of Vir-
ginia.
Cherry Birch. *Bouleau Cerisier*, by
the Canadians.

Betula Lutea,
Yellow Birch. { *Yellow Birch*, name given to this
species in Vermont and New Hamp-
shire, as well as in Maine and New
Brunswick.

Castanea Vesca,
Chesnut. { *Chesnut*, only name given to it in all
parts of the United States where it
grows.

Botanical and most
common American
name.

Vulgar names employed in various parts of the United
States and Canada.

*Castanea Pu-
mila,
Chincapin.*

{ *Chincapin*, only denomination given to
it in the middle, southern, and west-
ern states.

*Fagus Sylves-
tris,
White Beech.*

{ *Beech*, in the middle and southern states.
White Beech, in the northern states and
District of Maine.

*Fagus Ferrugi-
nea,
Red Beech.*

{ *Red Beech*, in the northern states, and
District of Maine.

*Chamærops Pal-
meto,
Cabbage Tree.*

{ *Cabbage Tree*, or *Palmetto*, in the
southern states. This tree is exten-
sively used in the construction of
wharves in Charleston, South Caro-
lina, being free from the ravages of
the worms.

*Ilex Opaca,
American
Holly.*

{ *American Holly*, so called in all the
parts of the United States where it
grows.

*Diospiros Virgi-
niana,
Persimmon
Tree.*

{ *Persimmon*, only name in these parts
of the United States where it is
found, being in the middle and south-
ern states.
Plaqueminier, by the Louisianians.

*Acer Eriocar-
pum,
White Maple.*

{ *White Maple*, only name on the borders
of the Ohio, and the rivers which
fall into it.
Soft Maple, in the Atlantick states,
where it is often confounded with the
Scarlet Maple.
Sir Wager Maple, name applied to it
in England, where it has been intro-
duced.

Botanical and most common American name.

Vulgar names employed in various parts of the United States and Canada.

- Acer Rubrum*,
Red-flowering Maple. { *Red-flowering Maple*,
Swamp Maple,
Soft Maple, denominations in the Atlantick states.
Scarlet-flowering Maple, principally in Virginia; and *Soft Maple* in New York and New Jersey.
Maple Tree, in Pennsylvania, Virginia, and Ohio, to the west of the Alleghany mountains.
Erable Plaine, by the Canadians.
- Acer Saccharinum*,
Sugar Maple. { *Sugar Maple*, general name; which however prevails only in the middle states, to the east of the mountains.
Rock Maple, name which prevails to the north of the Hudson river.
Hard Maple, another name in the northern states.
Erable Sucré, Canadian name.
- Acer Nigrum*,
Black Sugar Maple. { *Sugar Tree*, general name in the country on the Ohio, and the rivers which fall into it; and often applied also there, to the last mentioned species.
Black Sugar Tree, name sometimes applied, and to be preferred.
- Acer Negundo*,
Box Elder. { *Box Elder*, only name in the western states, where the tree is most known.
Ash-leaved Maple, name given sometimes in the Atlantick states.
Erable à Giguière, by the Illinois French.
- Acer Striatum*,
Moose Wood. { *Moose Wood*, common name in all the northern states, in New Brunswick and Nova Scotia.
Striped Maple, by some persons in the middle states.
- Nyssa Grandidentata*,
Large Tupelo. { *Large Tupelo*, most general name in the southern states.
Water Tupelo, secondary name in the same states.

Botanical and most common American name	Vulgar names employed in various parts of the United States and Canada.
<i>Nyssa Capitata</i> , <i>Sour Tupelo</i> .	{ <i>Sour Tupelo</i> , in Georgia.
<i>Nyssa Sylvatica</i> , <i>Black Gum</i> .	{ <i>Black Gum Tree</i> , in all the states to the south of the Delaware. { <i>Sour Gum</i> , secondary name in the same states. { <i>Peperidge</i> , by the Dutch of New Jersey.
<i>Gymnocladus Dioica</i> , <i>Coffee Tree</i> .	{ <i>Coffee Tree</i> , only name given in the western states. { <i>Chicot</i> , by the Canadians. { By some botanists called <i>Guilandina Dioica</i> .
<i>Pinckneya Pubens</i> , <i>Georgia Bark</i> .	{ <i>Georgia Bark Tree</i> , name given by M. Michaux; it is known by no name in that country.
<i>Cupressus Disticha</i> , <i>Cypress</i> .	{ <i>Cypress</i> , general name in the United States. { <i>Note</i> . It is not known at all in the northern states, except in modern plantations, and there called <i>Deciduous Cypress</i> . { <i>Bald Cypress</i> , name less used. { <i>Black</i> , or <i>White Cypress</i> , having regard to the colour of the wood.
<i>Cupressus Thuyoides</i> , <i>White Cedar</i> .	{ <i>White Cedar</i> , only name in the states of New York, New Jersey, Delaware, and Pennsylvania. { <i>Juniper</i> , in Maryland, Virginia, and North Carolina.
<i>Thuja Occidentalis</i> , <i>Arbor Vitor</i> .	{ <i>Arbor Vitor</i> , secondary name in the District of Maine. { <i>White Cedar</i> , name more used in Maine, Vermont, and New Hampshire. { <i>Cedreblanc</i> , by the Canadians.

Botanical and most common American name.

Vulgar names employed in various parts of the United States and Canada.

Larix Americana,
American Larch. { *American Larch*, general name given to this tree in all parts of the United States where it grows.
 { *Hackmatack*, more used in the north, and in the District of Maine.
 { *Tamarach*, by the Dutch of New Jersey.

N. B. This tree is very seldom called by the name of *Larch* in New England, and, in some districts, it is called *Juniper*.

Juniperus Virginiana,
Red Cedar. { *Red Cedar*, only name given to this tree in all parts of the United States where it grows.
 { Q. Is it not sometimes called *Savin*?

Olea Americana,
Devil Wood. { *Devil Wood*, name given to this tree on the Savannah river, in Georgia.

N. B. We doubt the expediency of establishing this unfashionable name to any tree.

Carpinus Ostrya,
Iron Wood. { *Iron Wood*, only name in all the states to the south of the Hudson.
 { *Lever Wood*, in the District of Maine and Vermont.

Carpinus Americana,
American Hornbeam. { *American Hornbeam*, only name given to this tree throughout the United States.

We doubt whether it is ever called any thing but simply, *Hornbeam*.

Hopea Tinctoria,
Sweet Leaves. { *Sweet Leaves*, only name in use in the southern states.

Malus Coronaria,
Crab Apple. { *Crab Apple*, name given to this tree in all the southern states.

Q. Is this a native or indigenous tree?

Botanical and most common American name.

Vulgar names employed in various parts of the United States and Canada.

*Mespilus Arbo-
rea,*
June Berry.

{ *June Berry*, name given to this tree in the middle states.
{ *Wild Pear*, in the District of Maine.

*Magnolia Grandi-
flora,*
Large Magnolia.

{ *Large Magnolia*, most common name in the cities of the southern states.
{ *Big Laurel*, in the country of the southern states.
{ *Laurier Tulipier*, by the Louisianians.

Magnolia Glauca,
Small Magnolia.

{ *Small Magnolia*, name given to this tree by many persons in New York and Philadelphia, as well as in some parts of New Jersey.
{ *Swamp Sassafras*, secondary name at a given distance from the above cities.
{ *Sweet Bay, White Bay, and Swamp Laurel*, names more used in the southern states.
{ *Beaver Wood*, name formerly given to it in New Jersey.

*Magnolia Acu-
minata,*
*Magnolia Cu-
cumber Tree.*

{ *Cucumber Tree*, only denomination in all the western states, and along the Alleghany mountains.

*Magnolia Cor-
data,*
*Heart-leaved
Magnolia.*

{ *The heart-leaved Magnolia*, name given to this species in Upper Georgia, and which is confounded with the preceding.

*Magnolia Tripe-
tala,*
*The Umbrella
Tree.*

{ *The Umbrella Tree*, only name given to this tree in the middle and southern states.

*Magnolia Auri-
culata,*
*The ear-leaved
Magnolia.*

{ *The ear-leaved Magnolia.*
{ *Indian Physick*, denomination most in use in the mountains of North Carolina and Virginia, but less proper.
{ *Long-leaved Cucumber Tree*, second name in the same countries.

Botanical and most common American name.

Vulgar names employed in various parts of the United States and Canada.

<p><i>Kalmia Latifolia</i>, <i>Mountain Laurel</i>.</p>	}	<p><i>Mountain Laurel</i>, most common name in the Alleghany mountains. <i>Sheep Laurel</i>, secondary name in the same places. <i>Calico Tree</i>, in some parts of the southern states.</p>
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N. B. M. Michaux considers, that this plant is not found to the north of the Hudson River. It is abundant in some parts of Massachusetts, where it is generally only a shrub. He says, it grows in Carolina to the height of 15 or 20 feet, and, as its wood is very hard, it is applied to some useful purposes in the arts.

<p><i>Cerasus Virgini-ana</i>, <i>Wild Cherry</i>.</p>	}	<p><i>Wild Cherry</i>, only name given to this tree throughout the United States.</p>
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<p><i>Cerasus Caroliniana</i>, <i>Wild Orange</i>.</p>	}	<p><i>Wild Orange</i>, only name given to this tree in the southern states.</p>
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<p><i>Cerasus Borealis</i>, <i>Red Cherry</i>.</p>	}	<p><i>Red Cherry</i>, name less used than that of small (or dwarf) cherry, but which is more appropriate.</p>
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<p><i>Annona Triloba</i>, <i>Papau Tree</i>.</p>	}	<p><i>Papau</i>, only name given to it in the middle and western states.</p>
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<p><i>Gleditsia Triacanthos</i>, <i>Honey Locust</i>.</p>	}	<p><i>Honey Locust</i>, known under this name only, in all parts of the United States where it grows.</p>
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N. B. M. Michaux is mistaken in this general assertion. It is also called *Three-thorned Acacia*, in the catalogues of the nurserymen.

<p><i>Gleditsia Monosperma</i>, <i>Swamp Locust</i>.</p>	}	<p><i>Swamp Locust</i>, in the maritime parts of the southern states. <i>Water Locust</i>, secondary name in the same parts of the southern states.</p>
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<p><i>Laurus Sassafra</i>, <i>Sassafras</i>.</p>	}	<p><i>Sassafras</i>, only name given to this tree in the United States.</p>
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Botanical and most
common American
name.

Vulgar names employed in various parts of the United
States and Canada.

*Laurus Caroli-
niensis,*
Red Bay.

{ *Red Bay*, only name given to this tree
in the maritime parts of the southern
states.

*Platanus Occi-
dentalis,*
Button Wood.

{ *Button Wood*, name generally given in
the United States, particularly the
Atlantick ones.
Plane and *Sycamore*, names more used
in the western states.
Water Beech, name given to it in some
parts of Maryland and Virginia.
Cotonier, by the French of Upper
Louisiana.

*Liquidambar
Styraciflua,*
Sweet Gum.

{ *Sweet Gum*, only name in the United
States.

*Lyriodendron
Tulipifera,*
*Poplar, or Tulip
Tree.*

{ *Poplar*, general name in the United
States. N. B. This is an evident
mistake of M. Michaux. It is seldom
called poplar, and it is an improper
name to be affixed to it, as its popu-
lar one.
Tulip Tree, most common name in the
northern states, where it is only
known as a cultivated tree.
Yellow, or White Poplar.
White Wood, name in the Genessee
country.

Bignonia Catalpa,
Catalpa Tree.

{ *Catalpa Tree*, general name in the
southern states.

*Andromeda Ar-
borea,*
Sorel Tree.

{ *Sorel Tree*, name given to this tree on
the Alleghany mountains, and in the
middle states.

*Celtis Occiden-
talis,*
Nettle Tree.

{ *Nettle Tree*, in *all* the United States.
N. B. We doubt its having such,
or any other name in the northern
states.

Botanical and most
common American
name.

Vulgar names employed in various parts of the United
States and Canada.

Celtis Crassifolia, <i>Hackberry Tree.</i>	{ <i>Hackberry Tree</i> , only name given to it in Kentucky and Tennessee. <i>Hoop Ash</i> , upon the borders of the Ohio river, in Pennsylvania and Vir- ginia. <i>Black Elder</i> , less common name in the same places.
Morus Rubra, <i>Red Mulberry.</i>	{ <i>Red Mulberry</i> , only name given to this tree in all the United States.
Pavia Lutea, <i>Buck Eye.</i>	{ <i>Buck Eye</i> , only name given to it on the Alleghany mountains, and in the western states. M. Michaux ought to have added, that it is also called the <i>Yellow-horse Chesnut</i> .
Æsculus Ohioen- sis, <i>Ohio Buck Eye.</i>	{ <i>Ohio Buck Eye</i> , name given by M. Mi- chaux, who claims to have been the first who distinguished it.

N. B. The popular name of this tree ought also to be either American, or Ohio Horse Chesnut; for M. Michaux admits it is in truth a Horse Chesnut, and it would be very embarrassing to admit such confusion in popular names.

Robinia Pseudo- Acacia, <i>Locust Tree.</i>	{ <i>Locust Tree</i> , general name in the Unit- ed States. <i>Yellow Locust</i> , <i>Red Locust</i> , <i>Black Locust</i> , different names given to this tree on the Susquehannah, hav- ing regard to the varied colour of the wood.
Robinia Viscosa, <i>Rose-flowering Locust.</i>	{ <i>Rose-flowering Locust</i> , name given by M. Michaux to this tree in the Che- rokee country, where it has no pecu- liar name. N. B. It has, however, been called so elsewhere.
Virgilia Lutea, <i>Yellow Wood.</i>	{ <i>Yellow Wood</i> , name given to this tree in Tennessee.

Botanical and most common American name.

Vulgar names employed in various parts of the United States and Canada.

Ulmus Americana,
White Elm. { *White Elm*, general name given to this tree, in all parts of the United States where it grows. *Michaux*.

N. B. We doubt the generality of this application. It is new to us. It is generally called, in the vicinity of Boston, *American Elm*, or simply *Elm*.

Ulmus Alata,
Wahoo. { *Wahoo*, name given to this species in the maritime parts of the southern states.

Ulmus Rubra,
Red Elm. { *Red Elm*, most common name in all parts of the United States where it grows.
 { *Slippery Elm*, secondary name in New York and New Jersey.
 { *Moose Elm*, in the upper parts of New York.
 { *Orme Gras*, by the Illinois French.

Planera Ulmifolia,
Planer Tree. { *Planer Tree*, name given to it to preserve the memory of some individual. *Michaux*.

N. B. We are not told who this personage was, nor why the tree (as M. Michaux, in the French idiom remarks) was *consecrated* to him.

Populus Tremuloides,
American Aspen. { *American Aspen*, name given to this tree in the northern and middle states. *Michaux*. N. B. Sometimes called Aspen Poplar, and sometimes Poplar only.

Populus Grandidentata,
American Large Aspen. { *American Large Aspen*, name given by M. Michaux to this species, which is ordinarily confounded with the preceding one.

Populus Argen-tea,
Cotton Tree. { *Cotton Tree*, known by this name on the Savannah river.

Botanical and most common American name.

Vulgar names employed in various parts of the United States and Canada.

Populus Hudsonica,
American Black Poplar.

{ *American Black Poplar*, name given by M. Michaux to a species (as he says) before destitute of a name.

Populus Monilifera,
Virginian Poplar.

{ *Virginian Poplar*, name given in Europe to this species.

Populus Canadensis,
Cotton Wood.

{ *Cotton Wood*, name given to this tree on the Mississippi, and the rivers which flow into it.

Populus Angulata,
Carolinian Poplar.

{ *Carolinian Poplar*, name given to it in Europe, because first brought from Carolina.

Populus Balsamifera,
Balsam Poplar.

{ *Balsam Poplar*, known under this name in Canada.

N. B. It is probable M. Michaux means by this or the next, the tree which is called *Black Poplar*, *Tacamahac*, and *Balm of Gilead Poplar* in the state of Massachusetts.

Populus Candicans,
Heart-leaved Balsam Poplar.

{ *Heart-leaved Balsam Poplar*.

N. B. If this is a different species from the last, it is the *Tacamahac* of Massachusetts.

Tilia Americana,
Bass Wood.

{ *Bass Wood*, prevailing name in the northern and middle states.
{ *Lime*, name almost as frequent.

Tilia Alba,
White Lime.

{ *White Lime*, this species on the Ohio, is confounded with the last.

Botanical and most common American name.	Vulgar names employed in various parts of the United States and Canada.
<i>Tilia Pubescens</i> , <i>Downy Lime</i> <i>Tree.</i>	} <i>Downy Lime Tree</i> , thus called in the southern states.
<i>Alnus Serrulata</i> , <i>Common Alder.</i>	
<i>Alnus Glauca</i> , <i>Black Alder.</i>	} <i>Black Alder</i> , in Vermont.
<i>Salix Nigra</i> , <i>Black Willow.</i>	
<i>Salix Ligustrina</i> , <i>Champlain Wil-</i> <i>low.</i>	} <i>Champlain Willow</i> , name given by M. Michaux, who found it on Lake Champlain in great plenty.
<i>Salix Lucida</i> , <i>Shining Willow.</i>	
	} <i>Shining Willow</i> , name given by M. Michaux.

We have given the above list, because we thought it might be of general use, as the work of M. Michaux is too large to be within the reach of intelligent and well educated farmers generally, and because we know not where they can find a catalogue of the forest trees of the United States, detached from large botanical works. It is also very convenient, as exhibiting the variety of common names applied to our trees in different states.

It is not probable, that it is perfect. It could hardly be expected that any individual, much less a foreigner, could in a few years make such a list complete and free from all errors. Many vulgar names must have escaped him, which others may discover. We propose in the next number, to select some of the most judicious remarks of M. Michaux, on our most important and valuable trees; and suggest some ideas on the measures to be adopted to encourage the planting and preservation of forest trees.

COMMUNICATION FROM JOHN PRINCE, ESQ. TO THE
MASSACHUSETTS AGRICULTURAL SOCIETY.

Jamaica Plain, October, 1817.

IN 1812, I received from a friend in Connecticut some orchard grass-seed (*Dactylis Glomeratus*) which was sown on about one acre of land; from being too thin seeded, our natural grasses and weeds came up with it, and it remains much in clumps, though becoming thicker every year; it shoots earlier than other grasses; starts immediately after the scythe, and continues green later than other grasses, and, I think, very valuable and productive, if sown in sufficient quantity to fill the ground, and excellent as a pasture grass from its quick growth, and does well under the shade of trees.

I am well convinced our farmers generally do not put one half grass-seed enough in laying down land, thereby allowing other grasses and weeds to fill the ground. I have succeeded best in laying down lands in the fall.

In 1813, Dr. Dexter gave me a small quantity of tall-meadow-oat-grass-seed (*avena elatior*) sent him by Mr. Ely of West Springfield. I was induced, from the success of it the next year, to procure from Philadelphia one and an half bushels, which I put on one and an half acres. This was not more than one third sufficient to fill the ground, and, in consequence, I allowed it to drop some of its seed, in hopes of giving it a better coat; the residue was threshed, and saved one hundred and fourteen pounds, equal to eleven and an half bushels, and was sold for one dollar per pound. It is now becoming thicker, and makes good hay, if cut early; it comes on very early in the spring, and continues late; makes admirable pasturage; all my cattle and sheep are very fond of it.

Passing through New York three years since, I purchased a few stolones of *Fiorin grass*, which were in my

trunk six weeks before planting. I have now a patch of fifty feet square; the soil is too dry for it; but I am fully convinced, in a proper soil (swampy or low meadow) it will prove a most valuable grass. Dr. Richardson of Ireland, gives wonderful accounts of the produce and value of it; and as far as I can judge, from the small trial I have made, am satisfied of its correctness. My horses are very fond of it. Any agricultural gentleman, having suitable land, and wishing to try it, is welcome to some of it for experiment.

For three years past I had been endeavouring to procure some seeds of the Guinea grass, so highly extolled in one of Arthur Young's works, and therein stated as having been cultivated in the vicinity of Boston, New England, with great success. I had some, first, from *Natchez*, none of which vegetated. Last spring, a friend procured me some from Havanna, part of which I sowed in my garden, rather late however. It has grown very luxuriantly, and, if it lives through the winter, I shall consider it a very great acquisition; the leaf is large, high, and a great quantity from a single root; it was not sown early enough to produce seed this year; my horses eat it very freely.

I imported last spring from England, the following seeds of grasses, all of them highly recommended:—

<i>Alopecurus pratensis,</i>	or	meadow fox tail.
<i>Festuca duriuscula,</i>	„	hard fescue.
<i>Festuca pratensis,</i>	„	meadow fescue.
<i>Lolium perenne,</i>	„	perennial rye grass.
<i>Poa pratensis,</i>	„	great meadow grass,

and saintfoin.

They came too late for field culture, and were tried in small quantity in the garden; a small portion of the seed only vegetated. They were very scarce and dear in England, in consequence of the very unfavourable season of 1816. By same conveyance I received some spring tares, or vetches; they produced a great deal of foliage and

would, I doubt not, answer admirably for green soiling; but wishing to save the seed, and the season becoming dry, they have yielded much less than I expected.

[To the Corresponding Secretary.]

Quincy, 20th November, 1817.

SIR,

It seems yet to be a question among practical farmers, whether an equal product can be obtained by planting potatoes cut, as by planting them whole. Accidentally a fact fell under my observation the last summer, which has gone far to satisfy my mind on the subject, and I, therefore, in conformity to the wishes of the board, communicate it.

I had directed my farmer to plant a field of about six acres, with the large red potatoe, called the Spanish potatoe. Being not present when he began the labour, he had planted a part of two rows, with the *potatoe whole*. Coming upon the field, I objected to the practice as wasteful, and directed him to cut the residue of the potatoes, and to put a mark so as the place where the whole potatoes were planted, might be known. In the whole course of vegetation, the whole potatoes had a decided superiority over every other part of the field, in the vigor and size of the tops; and, at harvest, on comparing these rows with the adjoining rows, the product of the rows planted whole, exceeded an equal extent of the adjoining rows, planted with cut potatoes, *more than one third*. There was nothing in the cultivation, or state of the land, which could produce this difference, except the circumstance of the one having been planted whole, and the other cut.

Respectfully, I am,
your obedient servant,

JOSIAH QUINCY.

ACCOUNT OF A WHEAT CROP, BY DANIEL HOWARD, ESQ.
OF NEW GLOUCESTER.

[Although Mr. Howard's wheat crop was not so large as to entitle him to a premium, not being so great as that of two other applicants, yet we publish his affidavit, partly to shew him our respect, and our sense of the spirited cultivation detailed by him, and partly to awaken the attention of our farmers still more to the subject of raising wheat. Its success is manifest by the returns made from all parts of this state. We had applications for premiums from Berkshire, Worcester, and Cumberland, and the smallest product was nearly 30 bushels to the acre. It is said the average crop of the middle states will not exceed twelve bushels. We would not be thought to believe, that the average here would be as large as that we have above mentioned.]

IN the spring of 1814, I began to cultivate a tract of land situated in the town of New Gloucester, in the county of Cumberland, twenty-six miles northward of Portland, which had been cleared nearly forty years, and improved as mowing and tillage during that time, but principally as mowing; and was so much impoverished, that it did not produce more than five or six hundred of hay to the acre. The soil was hard, dry, and rocky. The original growth, beach and rock maple.

The method I had adopted was as follows:—After ploughing in the spring of 1814, I hauled from the barn about six or eight loads of green manure, which I spread on about half an acre, and harrowed in the same with a large iron harrow. I then hauled on about the same quantity of old manure from the barn yard, which I put in hills or holes for corn, with which I planted the same, and had at the rate of forty bushels to the acre. In 1815, I ploughed another small piece of green sward, adjoining the former, of about the same quantity; put on six or eight loads of green manure from the barn, and harrowed it in as before. I then put on the whole tract ten or twelve

loads of old manure, which I put in holes or hills, and planted with corn, which yielded nearly forty bushels to the acre; there not being much difference in the corn, on the old or new ground. In 1816, after manuring the whole with old manure principally, which I put in holes or hills, I planted the former with potatoes, and had at the rate of three hundred and twenty or thirty bushels to the acre. My corn was cut off by the frost in September, and produced nothing.

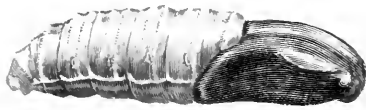
In April, 1817, I ploughed my ground for wheat in a wet, damp, cloudy day; let it lay until it had been dried by a few days' sun; then harrowed it with a large iron harrow; but put on no manure. I then prepared my wheat, by washing it clean. Put it into a tub; mixed three quarts of slacked lime with a bushel; stirred it together, so that some portion of lime might adhere to each grain of wheat. I then poured in water, until the wheat was nearly covered with the water. In this situation I let it remain from twelve to sixteen hours, often stirring it. I then mixed ashes with the wheat, until it was sufficiently dry to sow. I then sowed on one acre and nine rods and one half of ground, one bushel and three pecks of wheat. I put nothing on the ground as manure, excepting as above stated, and harrowed in the same with an iron harrow, from which I have reaped and threshed thirty bushels and one half of good clean wheat, weighing fifty-nine pounds and one quarter per bushel, a sample of which I herewith send, for the inspection of the Agricultural Society.

DANIEL HOWARD.

New Gloucester, Oct. 10, 1817.

Cumberland, ss. October 10, 1817. Personally appeared Daniel Howard, and made oath to the truth of the foregoing statement, by him signed before me.

ISRAEL SMITH, *Justice of the Peace.*



Copius robinia

I hereby certify, that at the request of Daniel Howard, Esq. of New Gloucester, I went with him to view his crop of wheat, then reaped and in his barn, which I had viewed often before; and I suggested to him, that it was his duty to make known to the Agricultural Society his mode of culture, and the extent of his profit; and went with him to measure the ground on which his wheat grew, and found, on an exact admeasurement, the stible ground was just one acre and nine and one half rods. This transaction took place on the fifteenth of September last; the grain did not appear so full and heavy as I have seen; but for size of the straw, and length of head, and uniformity, I think I never saw a handsomer field of wheat of the same extent in this part of the state.

ANDREW R. GIDDINGE.

Pejepscot, county of Cumberland, Oct. 9, 1817.

SOME NOTICE OF THE INSECT WHICH DESTROYS THE LOCUST TREE.

THE Robinia Pseudo-acacia, or common locust tree, though not originally indigenous in New England, is perfectly naturalized, and, in favourable situations, ripens its seeds, thriving in the most unproductive soil, which, in a few years, becomes clothed with verdure. This is, probably, owing to the tenderness of its foliage, which is easily decomposed, and converted into vegetable mould. From this ameliorating quality and the hardness and durability of its timber, it is one of our most valuable trees. It would, perhaps, be more proper to say it was, as there is scarcely a sound tree in this part of New England.

Michaux, in his history of the forest trees of this country, observes, that "the locust was cultivated in France about the year 1601." It flourishes there at this time, and

is justly prized for its valuable properties. It may be cultivated in the more temperate parts of Europe with advantage, as the insect which destroys it in this country, does not there exist.

According to Michaux, the ravages of this insect were first observed, about thirty or forty years since. He does not even conjecture what it is; and from the manner of life in the perfect state, and the shortness of its duration, I believe it is not generally known. The few observations I have made were collected several years since, and the hope of being able to add to them, has prevented me hitherto from communicating them.

In the month of October, 1803, I had several locust trees blown down by a storm; they were very much bored, and the heart-wood was dead. An opportunity now presented to discover something of this destructive insect; I selected a few billets of this wood, and placed them in a tight, empty closet, where they remained through the winter and ensuing spring. The remaining billets, on being opened, were found to contain several of the larva of different magnitudes.

They were true caterpillars, of that kind of which there are but few species, which feed on wood.

The general colour of the larva is red, approaching that of the cherry, paler toward the sides, deeper toward the middle of the back, and in each segment there are several tubercles, of a reddish chesnut colour, from each of which arises a small bristle. The under side of the body is paler, and of a dull white, very slightly tinged with red. The head is chesnut coloured, the teeth very dark, and almost black. It has sixteen feet, or eight pairs. Three pairs of these are placed in the three first segments of the body; these are terminated by a single claw, as in all caterpillars. Four other pairs are placed in the 6th, 7th, 8th, and 9th segments, and the eighth pair in the last division of the body.

The structure of the feet of these five pairs is very curious ; they are thick, short, and retractile, and terminated with a flattened oval surface, having on its edge a great number of small hooks, which are placed all round, except in the last pair, which has them only on the exterior half of the oval.

The body is a little depressed, or flattened, and tapers gradually from the ninth segment. The upper figure represents one of the larva about two-thirds grown, and somewhat contracted.

The furrows in the bark of the locust are large and deep, extending, in some places, even to the liber or inner bark. It must be in the deepest of these furrows, that the egg to produce the caterpillar is deposited. The inner bark is thick and succulent, affording to the young larva a tender and proper food. The sap wood is harder ; this too is perforated to the perfect, or heart wood, on which it is afterward to feed. This it bores in various directions, obliquely upward and downward, making them larger as it increases in bulk. Some of these perforations are large enough to admit the little finger. The grubs of wood-eating beetles always provide a path for the escape of the perfect insect out of the wood, before they go into the nymph or chrysalis state. In the same manner does the caterpillar of the locust form an opening quite through the bark, before it forms its cocoon. An inspection of the scene of its labours, clearly discovers how every thing is done.

When the opening is formed, which is sufficiently large to permit the chrysalis itself to pass through, the caterpillar retreats to the bottom of it, which is sometimes three inches from the surface ; but it spins most diligently as it moves backward, and lines the hole through its whole extent with silk. When arrived at the bottom of its retreat, it spins its cell or cocoon, of a long oval form. The end toward the opening to the air is more slightly formed, and of looser

texture than the other parts. In this it remains quiet, with the head toward the opening, till the chrysalis is formed, and till the moth is ready to come out.

The chrysalis is about one and three quarters of an inch in length; that represented in the middle figure is a very large one, and near two inches in length. The anterior part which covers the head, thorax, and wings, is of a full chesnut colour; the abdomen paler, and divided into rings. On the back, the anterior edge of each ring is formed into a serrated line, which extends about two thirds round the abdomen. This line consists of acute points, a little flattened and directed backward, the points curving a little outward; they are dark brown. On the middle of each segment, or ring, is another line of similar, but smaller teeth, which extends about one third round the abdomen. On the last segment, on the under side, are four short hooked points, which are directed forward; these, probably, keep it in place, and prevent its pressing forward till it is mature.

In the silk-moth, and all others which I have had opportunity to observe, the chrysalis bursts in the cocoon, and the fluid which surrounded the new insect in it, escaping at the same time, so weakens or dissolves the fibre and texture of the silk, that the moth is able to extricate itself, leaving the chrysalis behind it; but this is not the manner in the locust moth. After remaining quiet till all its parts are fully grown, and it is ready to quit its prison, a certain quantity of exercise is necessary to break the ligaments which attach the moth to the shell of the chrysalis, and to loosen the folds of the abdomen. In taking this exercise, it can only move the abdomen in various directions: as one side of the rings is moved forward, the hooks, in the serrated lines above mentioned, take hold of the silk, and prevent their sliding back; the next flexure brings forward the opposite side of the rings, which are prevented by the points on that side from slipping back in the same manner, and the

chrysalis is forced out of the slightly woven extremity of the cocoon, and through the silk-lined cavity, till it is protruded for about one-third of its length out of the opening in the bark and into the air. Then, and not till then, the chrysalis bursts; the new moth extricates itself by means of its feet; attaches itself, in a perpendicular direction, to the bark of the tree, while its wings expand and dry, and its whole frame acquires tone and strength from the contact of the atmosphere.

This part of its economy is truly admirable. It is necessary it should be agitated, to loosen it in its chrysalis; and this is so constructed, that this agitation not only frees it from its cell, but also from the wood which contained it.

The moth comes out late in May, or early in June, I cannot say precisely which. Many insects of this order, attracted by the light of a lamp, enter apartments in the summer season. But the locust moth, I believe, never does. It frequents, I believe, only the groves or forests where its favourite trees abound, and though it must be plenty, is very rarely seen, being active only in the night.

I had thought it was confined to the locust tree, till a few years since, I found one of the larva on the floor of my wood-house, and, on examination, discovered that it had fallen in splitting a piece of black oak, in which I afterward found others. I recollected immediately, that I had several years before found one of the chrysalids sticking out of the ground beneath a black oak, the larva having eaten down from the trunk into the root, which was very near the surface of the earth.

The locust moth is an undescribed species of a genus, of which Fabricius describes six species. Two of these were known to Linnæus, and placed with his *Phalenæ*; but they differ so much in the manner of life in the larva state, and especially in the structure of the chrysalis, that they constitute very properly a distinct genus, which Fabricius has named *cossus*.

It has two small cylindrical palpi placed on the under side of the head, and curved upward toward the forehead: no tongue: the antennæ about as long as the thorax; they are nearly semi-cylindrical and tapering, set on the under side with a double row of short lamellæ, placed like the teeth of a comb. In the male, these are longer than in the female.

The head is light gray, the eyes and antennæ black; the thorax paler, with an oblique line of black from each shoulder toward the insertion of the hinder wings; the abdomen is gray above, paler or whitish beneath; the wings dirty or ashen white, thickly clouded and reticulated with brownish-ash, alike on both sides, the under side rather darkest, the anterior edge marked with black bars, in both upper and under wings. The male resembles the female in colour, except that the inner angle of the under wings is of a rusty orange colour, but is considerably less than the female. The feet are black, with whitish rings. It may be called *Cossus* (*Robinia*) *cinereus*, *alis fusco nebulosis*, *albido punctatis*; *thorace linea humerali nigra*.

The perfect insect is represented in the lower figure.

It is probable, that the larva lives in the wood three years or more, before it acquires its full growth. In its form, colour, and mode of life, it exceedingly resembles the *cossus ligniperda* of Fabricius, *phalæna cossus* of Linnaeus, an insect of Europe; but that is larger, and feeds in wood of the willow and other trees in a decaying state.

This imperfect account of this insect will, I hope, induce some person, who resides near forests of black oak or groves of locusts, to investigate this subject more thoroughly. It is desirable to know at what time nearly, the moth appears; how it conceals itself in the day time; at what time the eggs are deposited, and how long the larva remains in the wood before it goes into chrysalis.

There is another insect which inhabits the locust tree, and which, doubtless, injures it considerably. It is one of

the wood-eating beetles, and was first described by Forster in 1771. It is the *leptura robinæ* of Forster, *clytus flexuosus* of Fabricius. It is three fourths of an inch long, black, with transverse stripes of yellow, which are straight on the thorax, and waved on the wing cases; the legs rust-coloured.

The larva of this eats into the sap-wood, and into the perfect wood. I once found a perfect insect, but dead, in the very heart of the tree. The injuries of this are comparatively small; the great destroyer is the *cossus*.

A PROFITABLE DAIRY.

[It may appear to some of our readers a little singular, that we should have requested Major Wheeler to furnish an account of the produce of his cows for publication. Those who have seen, in our last Number, the account of the produce of an English cow, amounting to 600 pounds of butter in a year, and of the Oakes, or Danvers cow, whose produce was 500, may be disposed to think little of Mr. Wheeler's statement. But the Trustees thought it would be of more consequence, and would be more likely to produce a spirit of emulation, to publish an account of a moderate experiment within the reach of every farmer, than merely to exhibit a few examples of most uncommon occurrence. The cases above referred to were almost prodigies, and were inserted rather to show what very extraordinary cows, with still more extraordinary feed, are capable of producing. They have some tendency to prove the importance of getting a good breed of cows, and of being more liberal in the manner of feeding them.

Mr. Wheeler's case is of another sort. It is an exhibition of profit from the ordinary mode of treatment, except that Mr. Wheeler appears to have been uncommonly attentive to manuring his pasture land, having, for many years, successively dressed it with plaster of Paris.

To shew that Mr. Wheeler's product is uncommon for our country, we shall here insert the answers which have been repeatedly made to the Society's question, How much butter is annually made from a cow, and how much skim milk cheese from the same cow?

From Brooklyn the answer was 70 pounds of butter and 50 pounds of skim milk cheese.

From the Middlesex and Sturbridge Societies, 70 weight of butter, and as much weight of cheese.

From the Shrewsbury U. Agricultural Society, that a medium cow will give 100 pounds of butter, and 150 weight of skim milk cheese.

From Newbury Agricultural Society, about 120 weight of each.

From Vassalborough Agricultural Society, about 100 weight of butter.

The Rev. Mr. Packard of Marlborough, made an answer to the question, which we wish was pasted up in every dairy in the state:—

“The last year, said he (1799) three cows in this town produced 273 pounds of butter. If their calves had been taken from them at a week old, they would have made 451 pounds of butter. Those *three cows* were a more productive dairy than *six usually* are, with ordinary feed. Farmers egregiously mistake, when they overstock their farms. Were dairies always estimated by the *pails of milk* they produce, instead of the *number of cows*, many farmer's wives, instead of asking their husbands to buy *another* cow, would urge him to *sell two* to enrich the dairy.”

In this sentiment the Trustees are fully of accord with Mr. Packard; and they earnestly desire to see the cows better kept, which will soon improve their quality.

It will be seen by this exhibit, that Major Wheeler's product was very far above the average, and well worthy of notice.]

Framingham, December 22, 1817.

DEAR SIR,

Yours of the 18th instant came to hand, wherein you wish information respecting my dairy. Last spring I had six cows, and the latter end of May I killed off the calves, and sold them at eight dollars and fifty cents each, making \$51. The latter end of June, I bought a small cow and calf; after keeping the calf 3 1-2 weeks, sold the calf for ten dollars. \$ 10

During the months, commencing the latter end of May and ending in November, which is six months, I made 941 1-2 pounds of butter, which

our marketter returned, on an average, 27 cents per pound, which amounts to the sum of	254 20
In the same time I made 1300 pounds of skim milk cheese, which I sold at 6 1-4 cents per pound, making	84 50
Total	\$ 399 70

Further account. In the month of December, I gathered cream enough to have made fifty weight of butter; but for want of knowledge in preparing the cream in cold weather, and of much labour lost, could not make it into butter, and had to make other use of the cream. The above number of cows, with one large yoke of oxen, were on about eighteen acres of pasturing until after we had done our haying, and the feed had grown from the mowing. The pasture is land where I have pastured for several years, and, excepting the two last years, have made free use of plaster, say about three bushels to an acre, three acres of which is low and cold, and produced but little feed.

I am, &c.

ABNER WHEELER.

R. Sullivan, Esq.

MEASUREMENTS OF THE GREAT OXEN, WHICH OBTAINED THE TWO FIRST PRIZES AT BRIGHTON, MASSACHUSETTS, OCTOBER 1817, TAKEN BY TWO OF THE TRUSTEES, THE 16th OF DECEMBER, 1817, COMPARED WITH THE OFFICIAL ACCOUNT OF THE FAMOUS ENGLISH OX, CALLED THE DURHAM OX.

Maximus. Magnus. The Durham Ox.

H HEIGHT at the shoulders	5 ft. 6 1-2 in.	5 ft. 2 1-2 in.	5 ft. 6 in.
Length from the nose to the end of the rump	11 ,, 3 1-2	10 ,, 9	11 ,, 0

	<i>Maximus.</i>	<i>Magnus.</i>	<i>The Durham Ox.</i>
Girt behind the shoulders	9 ft. 0 in.	9 ft. 0 in.	} 11 ft. 1 in.
Girt round the belly	10 ,, 1	10 ,, 2	
Breadth across the hips	2 ,, 6	2 ,, 6	3 ,, 1
Breadth across the middle of the body	3 ,, 1	3 ,, 1 1-2	3 ,, 1
Breadth across the shoulders	2 ,, 7 1-2	2 ,, 5 1-2	3 ,, 1
These measures were taken with a <i>straight piece of</i> <i>wood and a square.</i>			
Girt of the fore legs below the knee	0 ,, 11	Breadth first rib	0 ,, 9 1-4
		0 ft. 11 1-2 in.	0 ,, 9 1-4
Height of breast from the ground	1 ,, 8	1 ,, 8	1 ,, 6
Breadth between the fore legs	1 ,, 7	1 ,, 5	1 ,, 5

These two animals are six and an half years old. *Magnus* is considered to be in his prime. *Maximus* is thought, by good judges, to be in very good order, but still capable of having several hundred weight yet added, by proper care and attention.

WESTBROOK HEIFER.

[The following is an account of the extraordinary Heifer from Westbrook, exhibited at the Cattle Show at Brighton. It proves that some advantages, and indeed important ones, may be derived from introducing the improved breeds of other countries, and that so far from degenerating, they rather improve in our country. We shall endeavour to procure an engraving of this animal from the pencil of our ingenious and able artist, Mr. Fisher, but are not certain that it can be prepared in season for the present number.]

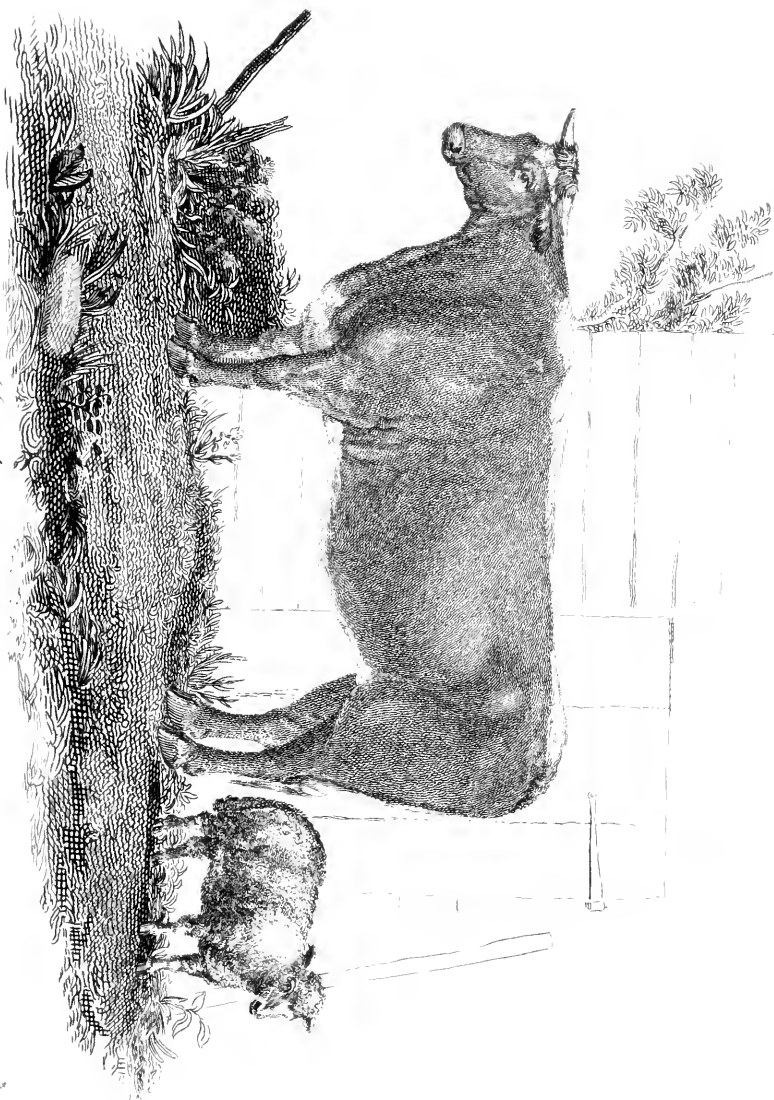
[To the Trustees of the Massachusetts Agricultural Society.]

Westbrook, January 2d, 1818.

GENTLEMEN,

BEING informed that you intend, in your Journal, to give a portrait of the Westbrook heifer which was raised by me, and

Woolly-headed Sheep.





sold to Mr. Benjamin H. Johnson, who exhibited her at the late Cattle show at Brighton, and that you wish for a statement of her pedigree, size, manner of feeding, &c. to accompany the portrait. The mother of the Westbrook heifer is from a cow of the broad horned Norfolk breed, and sired by a bull of the Bakewell breed, which was sent from England, as a present, to a gentleman in Nova Scotia. The cow is now five years and eight months old, girts seven feet, is of a fine form, gives a large mess of milk, which is of an excellent quality. Her first calf is a bull, and is a noble animal; her second calf is the Westbrook heifer, sired by an imported bull of the Bakewell breed, is now twenty-one months old.

Girt 6 feet 7 inches.

Length 7 ,, 4 ,, from the rump to the horns.

Height 4 ,, 11 ,,

Depth 3 ,, 2 ,, from the top of the shoulders to the brisket.

Thickness 1 foot 10 inches through the shoulders.

do. 1 ,, 10 ,, through the hips,

and weighs over seventeen hundred pounds. When first dropped from the cow, weighed 105 pounds; at six months old, weighed 600 pounds; at eleven months old, weighed 1002 pounds, and girted five feet and eleven inches; at eighteen months old, weighed 1520 pounds, and girted six feet and four inches; was kept on the cow, and had about three quarters of the milk, and feed with carrots, potatoes, and hay, till five months old; was then weaned, and kept in the barn and a small yard, and fed with hay, carrots, pumpkins, and potatoes, till fifteen months old, then turned to pasture, which was the first grass she was suffered to eat. She was never fed with corn, meal, or oats during the time I owned her, and had no extraordinary attention paid to her in feeding, &c. The last calf from this cow is a heifer, eight months old, and, I think, in every respect equal to the one produced the year before.

These cattle, I presume, equal any ever produced in America, for size and handsome form. The person to whom I sold them, proposes driving them to the southward in the spring, as he has had some handsome offers for them from that quarter. It will be a great loss to Massachusetts if they are carried out of the state, as such a breed of cattle cannot again be easily obtained, and there is no part of the world where finer cattle can be raised than Massachusetts; all that is wanted is a good breed and a little attention. Calves should never be suffered to eat any grass the first year; and, from experience, I find it much the cheapest to keep them shut up and feed them, as the land sufficient to pasture one calf, will produce hay and other articles sufficient to keep two calves through the year, and pay the expense of cultivation, and one year's growth will certainly be added to the cattle.

Your humble servant,

JOHN GORDON.

AGRICULTURAL INTELLIGENCE.

[It is very grateful to find some topics, upon which the people of different nations are of accord, and it is useful to encourage a free and liberal intercourse upon such subjects. The tendency certainly is to encourage and promote kind and generous affections, to allay national animosities, and, in some degree, (however feeble, we would hope considerable) to diminish those feelings of hostility, and prejudices, which are great auxiliaries to the schemes of ambitious and restless men, who would involve nations in wars, always injurious to the best interests of mankind. The following letters are published, principally with a view of shewing the liberal spirit which prevails among the cultivators of different nations. If the great body of farmers in every nation, who are always the victims, and never the gainers by wars, would cultivate such a spirit, and oppose the first indications of an hostile disposition in their rulers,

we might indeed cherish the hope of the termination of the greatest scourge of mankind.

The Massachusetts Agricultural Society, having directed their Corresponding Secretary, with a view to improve the breed of domestic animals of Massachusetts, to import a bull and two cows of the famous Norman breed, and the Hon. Mr. Thorndike having generously offered to import them in one of his ships, the Corresponding Secretary of this Society, without any previous acquaintance with the persons he addressed, ventured to presume upon the liberality of the celebrated Agricultural Society at Caen, in Normandy, in the kingdom of France, and requested them to select for the Massachusetts Society the animals which were desired.

This letter, from the Secretary of the Massachusetts Society, was received with the highest respect, and republished in many of the French Journals; and the following reply was made to Messrs. Welles, Williams and Greene, of Havre (who transmitted the communication from the Massachusetts Society) by the Secretary of the Agricultural Society at Caen.]

Caen, April 9, 1817.

The Secretary of the Society for the Promotion of Agriculture and Commerce, of the city of Caen,

MESSRS. WELLES, WILLIAMS AND GREENE,

GENTLEMEN,

It was not until Sunday last that we found your letter, and that of the Agricultural Society of Boston, addressed to our Society of Caen. During a residence of three weeks that I made at Paris, our Secretary mislaid several papers, among which those letters were found. I regret this still more, as the commission with which you are charged appears urgent, and a favourable occasion to send them presented itself.

The Society of Boston wishes for two cows with calf, and a bull, of the best species from Normandy. I do not hesitate to prefer the race of Cotentin and Brissac, between Isigne and Bayoux; it is at the same time remarkable for beauty and size. These are sought for from the country

of D'Auge, and by all Normandy. I do not know the cows of Alderney, which Mr. Lowell speaks of; he, probably, meant to say Gournay. Another motive for giving preference to the cattle of Cotentin is, that they are accustomed to feed at all seasons in the open fields, as is probably the custom in the environs of Boston; on the contrary, in a great part of Normandy, they are placed under cover. As to the rest, if the Society wish for cows with calf, there is no time to be lost, for they cannot be sent in February or March, for it is the season in which they calve, and they would not be able, in that state, to support a long voyage, being liable to sea-sickness as well as men; and it is to be feared, that they would miscarry in case they were sent with calf. You must, therefore, wait till the months of June and July. This, gentlemen, will be a source of consolation to me for having been so long in replying to you. If you determine to adopt the race of Cotentin, and have not correspondents in that place, I have taken the precaution to send you the names of honest and intelligent men in this part of the country.

I am very desirous, gentlemen, that the information I have given, however tardy, may answer the purposes of the gentlemen agriculturalists of Boston. We wish to prove to them, that we are always disposed to correspond with them, and to give them proofs of our entire devotion. Receive, gentlemen, the particular assurance of my esteem.

(Signed)

LAIR AT CAEN.

To this letter the Corresponding Secretary of the Massachusetts Society, being then at Havre, replied:—

Havre, July 31, 1817.

[To M. Lair, Secretary of the Society of Agriculture and Commerce at Caen.]

SIR,

Circumstances very unexpectedly have brought me into your country and vicinity, and my friends Messrs.

Welles, Williams and Co. have communicated to me the letter which you had the goodness to write to them on the subject of the cattle, which the Agricultural Society of Massachusetts wished to import from Normandy.

Accept, Sir, the gratitude of our Society, and, I may add, of my fellow citizens generally, both for the trouble you have taken in this affair, and the information which you have had the goodness to give; nor ought I to omit my acknowledgments for the very kind sentiments which you have been pleased to express. It proves that I was not mistaken when, though a stranger, I counted upon your zeal to promote whatever could contribute to the happiness or prosperity of mankind. In truth, in the arts and sciences the whole world should be considered but as a common country. I was not mistaken, when I spoke of the Alderney cows. Alderney is a small Island on your coasts, whose milch cows have long been celebrated in Great Britain. However, I shall rather rely on *your* advice, because your acquaintance with the different races of Norman cattle must be more intimate, and your judgment superior to that of any foreigners. I shall follow your advice precisely. I wish it had been in my power to have paid you a visit at Caen, but important private business deprives me of this pleasure.

Your humble servant.

To this letter a most flattering answer was received, showing the same liberal disposition to promote the views of the Society.



[The Bath and West of England Society having been long celebrated in every country where any attention is paid to agriculture, for the ardour, spirit, and intelligence with which it has conducted its agricultural researches, and having very liberally, on a former occasion, sent its publications to our Society, the Trustees, as well from these considerations, as the acknowledged and distinguished

merit of its President. Sir Benjamin Hobhouse, baronet, elected him an honorary member. The following reply to the letter which enclosed his diploma, will shew the manner in which that distinction was received, and the liberal feelings of the gentleman, on whom it was conferred.]

[To the Corresponding Secretary of the Massachusetts Agricultural Society.]

Wilton Park, October 13, 1817.

SIR,

By business of a publick and private nature, by weak health, and by domestick affliction, I have been prevented from acknowledging, at an earlier period, your favour from Liverpool, under date of the 16th of August, enclosing "the certificate of my admission, as an honorary member, into the Massachusetts Society for Promoting Agriculture." Your former letter, to which you allude, has miscarried.

The distinction, which has been thus conferred upon me, I shall ever hold in the highest estimation, because it has been bestowed by a society, eminent for its respectability and utility; and the diploma, which I shall carefully preserve among my most valuable records, will furnish me with a perpetual supply of self-congratulation and pride.

All nations have a common and reciprocal interest in the encouragement of agriculture. The associations for that purpose, in each country, should maintain constant intercourse; and it is peculiarly fitting, that it should take place between America and England, on account of their multiplied affinities.

As a member of the Massachusetts Society, I shall, in pursuance of my right and privilege, convey to you all the information in my power, calculated to advance the very useful end which it has in view; and I shall take this course, not merely from a sense of duty, but from a sincere desire to render beneficial service to the Society, and to the United States, of which it forms an important part. From the known liberality of your character, I am per-

suaded, Sir, that under the influence of the same principles, you will, through me, make the West of England Society acquainted, from time to time, with the agricultural improvements in America. Thus both nations will become essentially serviceable to each other.

I cannot conclude, Sir, without requesting you to accept my best thanks for the very polite and handsome letter, in which you forwarded my diploma.

Permit me to assure you in sincere language, that I have the honour to be

You faithful and humble servant,

BENJAMIN HOBHOUSE.

We learn, that since the last cattle show, Stephen Williams, Esq. of Northborough, has received from his brother, Charles Williams, Esq. of London, a fine Teeswater bull. He is said to have cost 500 dollars, besides the expense of transportation. This animal is of what is called the short-horned breed, and, in all the late agricultural works, the *Teeswater breed* are said to be the most esteemed. "Bulls and cows (says the Supplement to the Encyclopedia Britannica) from *this stock*, purchased at most extraordinary prices, are spread over all the north of England and the border counties of Scotland. The bone, head, and neck of these cattle are fine; the hide is very thin, the chine full; the loin broad; the carcass, throughout, large and well fashioned; and the flesh, and fatting quality equal, or, perhaps, superiour to those of any other large breed.

The short horns give a larger quantity of milk than *any other* cattle, a cow *usually* yielding twenty-four quarts per day, and three firkins of butter in the grass season. Their colours are much varied, but they are generally *red and white mixed*, or what the breeders called *flecked*."

Such is a very *moderate* sketch (for others are more extravagant in its praise) of this breed, which one of our fellow citizens has, with publick spirit, and, at considerable expense, introduced. We congratulate the country on this accession to its stock of cattle.

The Trustees of the Massachusetts Society for Promoting Agriculture, have introduced from England, at considerable expense, Cooke's famous drill, scarificator, and apparatus complete, calculated for the drill husbandry on a large scale. It is the most perfect apparatus now in use in England, for the above purposes. Its expense would be too great for small farmers, though one machine would serve for the sowing and dressing the arable land of six or eight contiguous small farms. The main object of the Trustees in introducing it was, that it might serve as a model from which our ingenious artists may take hints, and thereby form cheaper and more perfect instruments, or, at least, such as will be more adapted to the means and cultivation of our farmers. It will be placed, during the session of the Legislature, in some place where they can have access to it, and farmers and artists may at all times view it.

In the spring it will be tried on several farms, under the direction of the Trustees. The Trustees have also imported the celebrated Northumberland double-mould-board plough, with wings, circled coulters, &c. complete for *ridge work*. This will also be exposed to publick view.

They have since ordered a considerable number of other agricultural implements, which they expect in the spring.

A considerable addition has lately been made to their library, by an importation from France, Among other works, is the valuable "Annales de l'Agriculture Françoise," begun by Tessier, and continued by Bosc, in 50 or 60 volumes; the "Theatre d'Agriculture," by the

father of modern French agriculture, Olivier de Serres. All the Roman writers on agriculture, and many valuable treatises on different branches of the art. This library is deposited in the Boston Athenæum.

It is not probably generally known in this country, that the French cultivators burn their gypsum, or plaster of Paris, before they use it on their fields. Is it reduced by this to pure lime, or does it still retain a portion of sulphur? If the former is the case, where are its advantages over other lime, made from shells or common limestone? We shall give an analysis of a treatise on the application of plaster as a manure, by Monsieur Canolle, in our next number.

We are happy to learn, that the attention of our citizens, in various parts of our country, is turned to the improvement of our agriculture, and that societies are forming for its encouragement and for the diffusion of information on this interesting subject. We have heard, that such Societies have been formed in Maine, in the counties of Hampshire, Hampden, and Franklin, and in Virginia, of the latter of which, the late President Madison is the patron. We most sincerely wish them success. Full late has the publick interest been excited on this subject, and while measures have been adopted to promote other useful arts, that one, by which they all subsist, has been abandoned to its fate. We are sensible, this has proceeded from an opinion that agriculture does not need the fostering aid of governments, and can derive but little benefit from the discoveries of science, and the patronage of the wealthy. To this opinion we cannot accede; and we think the history of agriculture, for the last fifty years, in some of the best cultivated parts of Europe, is a complete refutation of it.

The rapid progress, which the cultivation of wheat has made in various parts of this Commonwealth, particularly in the District of Maine, would have been incredible, if it had been predicted twenty years since. It would not be more extraordinary, that Maine and Massachusetts should raise their own flour, and even supply the occasional wants of other countries, than that Georgia and Carolina should supply the British cotton looms with three-fifths of the raw material consumed by them. Thirty or forty years since, very little cotton was raised in those states, and now our exports in that production are nearly equal to the value of all the articles exported from the United States at the former period.

*It is said, that wheat has been advantageously exported from Maine to Maryland, the present year. But an insuperable bar to a very increased production of this grain, would be the want of merchant mills and capital to purchase up the wheat, and convert it into flour. It would be a great discouragement to our agriculture, or, at least, to the cultivation of wheat, if it must be exported to the southward, for the purpose of being manufactured.

It was therefore with pleasure, that we heard that a publick-spirited gentleman of Gardiner, in Maine, had erected a complete flour mill, on the plan of the flour-producing states. We hope neither capital, nor a disposition to encourage this infant establishment, will be withheld by the opulent citizens of the metropolis. We think Legislative patronage will not be necessary; but if it should be so, we should hope they would not be tardy in affording it, either by a bounty on flour manufactured in the state, or in exempting, for a time, such establishments from taxation. If, however, the farmers of Maine can afford to sell their wheat at 7s6 a bushel, we conceive there will only be a struggle who shall enter into the profitable business of

* This has been questioned, but it does not affect the general remark.

buying it, and converting it into flour. At any rate, we wish it full and complete prosperity.

The bull and cows, imported from Flanders by the Hon. Mr. Thorndike, but which arrived in an emaciated state, so as that no judgment could well be formed of them, are very much improved. The bull, which is now at Mr. Parson's at Brighton, has undergone a great change, and promises to become a fine animal.



ENGLISH PLOUGHING MATCHES.

Trials of skill and speed in ploughing, have been frequent in Great Britain for more than twenty years past. To enable our readers to compare the speed of our oxen and drivers with those of Great Britain, we publish the accounts of three ploughing matches in England, taken from the papers of the Bath and West of England Society for Promoting Agriculture.

In 1793, a match took place at King's Sedgmoor. The quantity of land, one quarter of an acre to each plough (the same as ours.) The performance took place in the following periods of time:—

Mr. Young's plough, with three horses,	1 hour 14 minutes.
Mr. Hassel's do. do.	1 do. 7 do.
Mr. Dorick's do. with 4 oxen,	1 do. 14 do.
Rev. Mr. Gapper's plough do.	1 do. 6 do.

Another match, in 1803, issued as follows. Half an acre to each plough, and ploughed by three teams, one with 4 horses, and the other two with 2 each.

The time taken by each was the same, 1 hour 36 minutes.

In 1788, there was another ploughing match. Three ploughs entered. Quantity of land *near* an acre. Furrows four inches deep and eight inches wide, performed as follows, with two horses each:—

First plough, three hours and four minutes.

Second plough, five hours and five minutes.

Third plough, five hours and an half.

It may be supposed by some, that our ploughing was not as deep and as well done. It will be seen, by reference to our report, that it was deeper, and no work could be smoother than a considerable portion of it was.

SHORT HISTORY OF THE FUNDS OF THE MASSACHUSETTS
AGRICULTURAL SOCIETY.

It is a proof of the care and good management of the predecessors of the present board, that this Institution has risen from such small beginnings.

We shall republish a list of the first donors, and the amount subscribed, partly with a view to shew how few persons were taxed to found this valuable institution, and partly to excite a laudable emulation in others.

Hon. Thomas Russell, 6 per cent. stock	\$ 1000
C. Vaughan do. do.	100
D. Sears 3 per cent.	200
J. Barrell do.	200
Hon. J. C. Jones cash	83
Hon. James Bowdoin	400
S. W. Pomeroy, Esq.	100
C. Gore, Esq. 2 shares <i>Bank</i>	800
A. Craigie, Esq. 1 share <i>Bank</i>	400
T. Lee, Esq. Cambridge	200
P. Jeffry, Esq.	200
J. Eliot, Esq.	100
J. Codman, Esq.	50
Dr. J. C. Lettsom	46
J. Blake, Esq.	25
James Tisdale, Esq.	25
Joseph Russell, Esq.	25
Russell Sturgis, Esq.	20
Jeremiah Allen, Esq.	10

\$ 3984

Such was the limited pecuniary foundation of this Society, by the prudent care of which, and the annual assessments, it has attained to so much respectability as to be able to offer, in premiums, 800 dollars a year, besides the sum given for that purpose by the government.

It will be perceived, that there are now hundreds of opulent men, who have not had an opportunity of patronizing this Institution. Such an occasion now presents itself. An edifice, to contain the implements, models, and new inventions in agricultural mechanicks; to receive and display the articles of manufacture which are sent for premiums, is much needed. Its cost would not exceed three thousand dollars, which is not more for the present state of our wealth, than one thousand dollars would have been at the period of the above subscription.

Shall the project fail for want of patronage? Well, be it so. But it shall not fail, without our recording one example of a fine spirit, worthy of New England. A gentleman, native of Massachusetts, now an inhabitant of Pennsylvania, still retains so much attachment to the interests of his native state, that when he saw the advertisement of the Trustees for a subscription for such an edifice, he instantly sent on a bank-bill for his part of the work, enclosed in an anonymous letter, in which he regrets, that the Trustees had asked for so small a sum as 3000 dollars, and expresses a conviction that a much larger sum could readily be obtained.

Having spoken of the first Trustees of the Society, it may not be improper to insert a list of them.

Hon. Thomas Russell, *President*.

Hon. John Lowell, *1st Vice President*.

Hon. Moses Gill, *2d Vice President*.

John Avery, Jr. Esq. *Recording Secretary*.

Oliver Smith, Esq. *Corresponding Secretary.*

Aaron Dexter, M. D. *Treasurer.*

Trustees.

Hon. James Bowdoin,

Christopher Gore, Esq.

M. Brimmer, Esq.

C. Vaughan, Esq.

Loammi Baldwin, Esq.

Samuel Parker, D. D.

OFFICERS OF THE SOCIETY FOR THE PRESENT YEAR, 1818.

Aaron Dexter, M. D. *President.*

S. W. Pomeroy, Esq. *1st Vice-President.*

Thomas L. Winthrop, Esq. *2d Vice-President.*

Hon. R. Sullivan, Esq. *Recording Secretary.*

John Prince, Esq. *Treasurer.*

John Lowell, Esq. *Corresponding Secretary.*

Trustees.

Hon. P. C. Brooks,

Samuel G. Perkins, Esq.

Hon. John Welles,

Gorham Parsons, Esq.

Hon. Josiah Quincy,

Ezekiel Hersey Derby, Esq.

The above Trustees, together with the President of Harvard College, the President of the American Academy of Arts and Sciences, and the President of the Massachusetts Medical Society, are also ex-officio visitors of the Professorship of Natural History at Cambridge, and have the care and superintendence of the botanical garden there.

[Gentlemen from various parts of this and the adjoining States, desirous of forming Agricultural Societies, having repeatedly applied for copies of the act incorporating this Society, and its rules and regulations, the Trustees, although sensible there is nothing worthy of particular notice in them, have thought it best to republish them for the gratification of those who have expressed a wish to see them. They will be found extremely simple, and the history of the

Society will shew, that it requires something more than a constitution on paper to give efficiency to such institutions. Nothing is effectual, but an active zeal in their members, and a corresponding spirit among the people.]

LAWS AND REGULATIONS, &c.

ACT OF INCORPORATION.

Commonwealth of Massachusetts, in the year of our Lord one thousand seven hundred and ninety two.

AN ACT TO INCORPORATE AND ESTABLISH A SOCIETY BY THE NAME OF THE MASSACHUSETTS SOCIETY FOR PRO- MOTING AGRICULTURE.

WHEREAS very great and important advantages may arise to the community, from instituting a Society for the purpose of promoting Agriculture, and divers persons having petitioned to this court to be incorporated into a Society for that laudable purpose.

Be it therefore enacted by the Senate and House of Representatives, in General Court assembled, and by the authority of the same, That the said petitioners, viz. Samuel Adams, John Avery, jun. Joseph Barrell, Martin Brimmer, Charles Bulfinch, John Codman, Edward Cutts, Aaron Dexter, Thomas Darfee, Moses Gill, Christopher Gore, Benjamin Guild, Stephen Higginson, Henry Hill, Samuel Holten, Benjamin Lincoln, John Lowell, Jonathan Mason, Jonathan Mason, jun. Azor Orne, Samuel Phillips, Thomas Russell, Samuel Salisbury, David Sears, James Sullivan, Cotton Tufts, Charles Vaughan, and Thomas Winthrop, together with such others who shall become members thereof, be, and they are hereby incorporated into, and made a body politic and corporate forever, by

the name of the *Massachusetts Society for Promoting Agriculture*.

And be it further enacted, by the authority aforesaid, That the said Corporation be, and are hereby declared and made capable in law of having, holding, purchasing and taking in fee simple, or any less estate, by gift, grant, devise, or otherwise, any lands, tenements, or other estate, real and personal; provided that the annual income of the said real and personal estate, shall not exceed the sum of ten thousand pounds, and also to sell, alien, devise, or dispose of the same estate, real and personal, not using the same in trade or commerce.

And be it further enacted, by the authority aforesaid, That the said Corporation shall have full power and authority to make, have, and use a common seal, and the same to break, alter, and renew at pleasure; that it shall be capable in law to sue and be sued, plead and be impleaded, answer and be answered unto, defend and be defended, in all courts of record, or other courts or places whatsoever, in all actions real and personal and mixed, and to do and execute all and singular other matters and things, that to them shall, and may appertain to do.

And be it further enacted, by the authority aforesaid, That the said Corporation may make, establish and put in execution, such laws and regulations as may be necessary to the government of said Corporation, provided the same shall in no case be repugnant to the laws and constitution of this state. And for the well governing of the said Corporation, and the ordering their affairs, they shall have such officers as they shall hereafter from time to time elect and appoint; and such officers as shall be designated by the laws and regulations of the said Corporation for the purpose, shall be capable of exercising such power for the well governing and ordering the affairs of the said Corporation, and calling and holding such occasional meetings for that purpose, as shall be fixed and determined by the said laws and regulations.

And be it further enacted, by the authority aforesaid,
That the end and design of the institution of the said Society is for the purpose of promoting useful improvements in Agriculture.

And be it further enacted, That the place of holding the first meeting of the said Society, shall be in the town of Boston, and that Samuel Adams, Esq. be, and he hereby is, authorized and empowered, to fix the time for holding the said meeting, and to notify the same to the members of the said Society, by causing the same to be published in one of the Boston newspapers, fourteen days before the time fixed on for holding the said meeting.

In the House of Representatives, March 7th, 1792. This bill having had three several readings, passed to be enacted.

DAVID COBB, *Speaker.*

In Senate, March 7th, 1792. This bill having had two several readings, passed to be enacted.

SAMUEL PHILLIPS, *President.*

Approved,
True copy,

JOHN HANCOCK.
Attest,
JOHN AVERY, Jr. *Secretary.*

RULES AND REGULATIONS.

Article 1. That there shall be a President, two Vice Presidents, a Recording Secretary, Corresponding Secretary, and Treasurer, who shall be Trustees ex officio; in addition to these, six other Trustees shall be chosen from the members at large, all of whom shall continue in office until others are elected in their stead.

Article 2. All officers, as well as new members, shall be elected by ballot. The election shall be determined by a majority of votes.

Article 3. There shall be two stated meetings of the Society annually, viz. on the first Wednesdays in April and October, the same to be held at 11 o'clock, A. M. at such place as the Trustees shall appoint, of which they shall give notice in one of the Boston newspapers, at least three weeks previous to said meeting.

Article 4. There shall be an annual choice of officers, viz. at the stated meeting in April, in the choice of whom, twenty members shall be necessary to make a quorum; in the transaction of other business, thirteen may make a quorum.

Article 5. If at any meeting of the Society or of the Trustees, the President and Vice Presidents should be absent, the members present may appoint one from among them to preside at such meeting.

Article 6. The President (or in case of his absence) either of the Vice Presidents, with the advice of the Trustees, may call a special meeting of the Society; or whenever written application, with reasons assigned therefor, shall be made by any twelve members of the Society, to the President and Trustees, they shall call such meeting.

Article 7. The meetings of the Trustees shall be held at such time and place, as they shall from time to time agree upon, seven of whom, with the presiding members, shall make a quorum for doing of business, except in the case of election of members.

Article 8. The Trustees shall regulate all the concerns of the Society during the intervals of its meetings, propose such objects of improvement to the attention of the publick, publish such communications, and offer premiums in such form and value as they shall think proper, provided the premiums offered do not exceed the funds of the Society; and shall lay before the Society at each of its meetings, a statement of their proceedings, and of the communications made to them.

Article 9. The candidate for election shall first be proposed by a member of the Society, and on being ballotted for, if the number of votes in favour of such candidate shall amount to a majority of the members present, such person shall be considered as duly elected.

Article 10. The Recording Secretary shall take minutes of all the votes and proceedings of the Society, and of the Trustees, and enter them in separate books, and shall record all such communications as the Trustees may direct.

Article 11. The Corresponding Secretary shall write all letters relating to the business of the Society, and answer all such letters to the Society, as the Trustees shall direct.

Article 12. The Treasurer shall receive all monies due or payable to the Society, and all donations that may be made to it, for which he shall give duplicate receipts, one of which shall be lodged with the Recording Secretary, and make a fair record thereof, and from time to time, pay out such monies that may be in the Treasury, as he shall have orders for from the Trustees, and shall annually, and whenever thereto required, render a fair account of all his receipts and payments, to the Society or a committee thereof. The Treasurer's accounts shall be kept in dollars and cents, and he shall give bonds for the faithful discharge of his duty, in such sums as the Trustees shall direct, and with such sureties.

Article 13. A Committee shall be chosen annually to audit the Treasurer's accounts, viz. at October meeting, and to report thereon, at the next April meeting, and the same being accepted, shall be entered by the Recording Secretary in his books.

Article 14. In case of the death, resignation, incapacity, or removal out of the state of either of the Secretaries or of the Treasurer, the Trustees shall take charge of the official books, papers, and effects belonging to the

office that may be vacated, and give receipts for the same, which books, papers, &c. they may deliver to some person, whom they may appoint to fill up the office until the next meeting of the Society, at which time there shall be a new choice.

Article 15. The present members of the Society, and such as may be elected previous to April meeting, 1793, shall for the present year severally pay into the hands of the Treasurer two dollars, for raising a fund for carrying into execution the designs of the institution; and thence afterwards two dollars annually shall be paid by each member, until otherwise ordered by the Society; the second year to be considered as commencing on the first Wednesday in April, 1793.

Article 16. A Committee shall be raised from time to time, severally to solicit and receive subscriptions for raising of a fund, for encouraging the noblest of pursuits, the agriculture of our country, the same to be sacredly appropriated to that purpose.



CATTLE SHOW, EXHIBITION OF MANUFACTURES, AND
 PLOUGHING MATCH, AT BRIGHTON, ON TUESDAY AND
 WEDNESDAY, THE 13th AND 14th OF OCTOBER, 1818. TO
 COMMENCE AT NINE O'CLOCK, A. M. ON EACH DAY.

THE Trustees of the Massachusetts Society for the Promotion of Agriculture, encouraged by the renewed patronage of the Legislature of this State, intend to offer in Premiums, not only the sum granted by the Government for that purpose, but also the whole amount of the income of their own funds; they, therefore, announce to the publick, their wish to have a Cattle Show, and Exhibition of Manufactures, at Brighton, on Tuesday and Wednesday, the

13 and 14th of October, 1813; and they offer the following Premiums:—

FOR STOCK.

For the best Bull, raised in Massachusetts, of any age, - - - - -	\$ 40
For the next best, do. do. do. - - - - -	25
For the best Cow, of any age, - - - - -	40
For the next best do. do. - - - - -	30
For the next best do. do. - - - - -	20
For the best Ox, fitted for slaughter, and weighing not less than 1800 wt. - - - - -	50
For the next best do. of any weight, - - - - -	40
For the next best do. do. - - - - -	30
For the best pair of Working Cattle, - - - - -	40
For the next best do. do. - - - - -	30
For the next best do. do. - - - - -	20
For the best Merino Wethers, not less than six in number, - - - - -	20
For the next best do. do. do. - - - - -	10
For the best native Wethers, not less than six in number, - - - - -	10
For the next best do. do. do. - - - - -	5
For the best Merino Ram, - - - - -	20
For the next best do. - - - - -	10
For the best Merino Ewes, not less than five in number, - - - - -	30
For the next best do. do. - - - - -	10
For the best Boar, not exceeding two years old, - - - - -	15
For the next best do. do. - - - - -	5
For the best Sows, two in number, not more than four, and not less than one year old, - - - - -	10
For the best Pigs, not less than two in number, not less than four months old, nor more than eight, - - - - -	10

For the next best do. do. do. - - -	5
For the best imported Bull, owned, and to be kept in the state of Massachusetts, for at least one year after this Cattle Show, - - -	100
For the next best do. do. do. as above, - - -	75
For the best imported Milch Cow, do. as above,	75
For the next best do. do. do. - - -	50

No animal, for which to any owner one premium shall have been awarded, shall be considered a subject for any future Premium of the Society, except it be for qualities different from those for which the former premium was awarded.

Any of the above stock (Wethers excepted) when raised and still owned at the time of exhibition, by the person who raised them, will entitle the claimant to an allowance of ten per cent. in addition.

FOR AGRICULTURAL EXPERIMENTS.

To the person who shall raise the greatest quantity of Wheat, on an acre, - - -	\$ 40
To the person who shall raise the greatest quantity of Carrots, on an acre, - - -	30
To the person who shall raise the greatest quantity of Potatoes, on an acre, - - -	30
To the person who shall raise the greatest quantity of Turnips, on an acre, - - -	30
To the person who shall raise the greatest quantity of any other Vegetable, suitable for the winter food of animals, and which shall equal in quantity, per acre, the greatest premium product, in this state, of either of the three preceding Vegetables, - - -	30
To the person who shall introduce any Grass, not before cultivated in this state, and prove, by actual experiment, and produce satisfactory evidence of its superiority to any now cultivated, - - -	36

- To the person who shall give satisfactory evidence on "Soiling Cattle," not less than six in number, and through the whole season, together with a particular account of the food given, and how cultivated, - - - 30
- To the person who shall make the experiment of turning in green crops as a Manure, on a tract not less than one acre, and prove its utility and cheapness over any other manure, giving a particular account of the process, and its result, - 30
- To the person who shall, by actual experiment, prove the best season and modes of laying down lands to grass, whether spring, summer, or fall seeding be preferable, and with or without grain, on different soils, - - - - 30

To entitle himself to either of the Premiums, under this head of Agricultural Experiments, the person claiming, must cultivate a tract of at least one acre in one piece, with the plant or production for which he claims a premium; and must state, in writing, under oath of the owner, and of one other person (accompanied by a certificate of the measurement of the land, by some sworn surveyor) the following particulars:—

1. The state and quality of the land, in the spring of 1818.
2. The product, and general state of cultivation and quantity of manure, employed on it the year preceding.
3. The quantity of manure used the present year.
4. The quantity of seed sown.
5. The times and manner of sowing, weeding and harvesting the crop, and the amount of the product, ascertained by actual admeasurement of the whole produce for which a premium is claimed.

The claim must be entered on the days hereinafter established for entering for the Premiums; but the evidence of the actual product need not be produced until after the Cattle show, and at any time preceding the first

day of the ensuing December: the Trustees not intending to decide upon claims, under the head of Agricultural Experiments, until their meeting in December.

FOR INVENTIONS.

To the person who shall invent the best, simplest, and least expensive Machine for threshing Wheat, or any small Grains, - - - - -	\$ 75
To the person who shall invent the best, simplest, and least expensive Machine for sowing small Seeds on an extensive scale, - - - - -	80
To the person who shall exhibit the best Plough, for common purposes, of an improved construction, and of his own invention, - - - - -	20
To the person who shall use the Drill Plough, or Machine, and apply it most successfully to the cultivation of any small Grains or Seeds, on a scale not less than one acre, - - - - -	20
To the person who shall produce at the Show any other Agricultural Implement of his own invention, which shall, in the opinion of the Trustees, deserve a reward, - - - - -	20

In all cases, proof must be given of the work done by the Machine, before it is exhibited; and of its having been used and approved by some practical farmer.

It is not the intention of the Society to grant a premium for any *patented implement*, unless the proprietor surrender said patent right to the Society, for the use of the state of Massachusetts, for an additional sum not exceeding the amount of premium.

FOR DOMESTICK MANUFACTURES.

To the person or corporation who shall produce the best specimen of fine Broadcloth, not less than 1 5-8th yards wide, exclusive of the list, 40 yards in quantity, and dyed in the wool, - - - - -	\$ 30
For the best second do. do. do. - - - - -	20

For the best superfine Cassimere, not less than 3-4 yards wide, nor less than 40 yards in quantity, -	15
For the second best do. do. do. - - -	10
For the best superfine Sattinet, 3-4 yards wide, not less than fifty yards, - - - -	10
For the second best do. do. do. - - -	6
To the person or corporation, who shall produce the best specimen of Cotton Cloth, manufactured in this state, not less than fifty pieces, - -	20
To the person who shall produce the best specimen of any other fabricks of Cotton, manufactured in this state, in publick factories, not less than fifty pieces, - - - - -	20
In private families, not less than five pieces, -	20

FOR HOUSEHOLD MANUFACTURES.

For the best Woollen Cloth, 3-4 yard wide, not less than 20 yards in quantity, - - - -	\$ 12
For the second best do. do. - - - -	8
For the best double milled Kersey, 3-4 wide, not less than 20 yards in quantity, - - - -	12
For the second best do. do. - - - -	8
For the best Coating, 3-4 yard wide, and not less than 20 yards in quantity, - - - -	8
For the second best do. do. - - - -	6
For the best Flannel, 7-8 yard wide, not less than 45 yards in quantity, - - - -	10
For the second best do. do. - - - -	7
For the best do. 4-4 yard wide Carpeting, not less than 30 yards in quantity, - - - -	15
For the second best do. do. - - - -	7
For the best 5-8 yard wide Stair Carpeting, not less than 30 yards in quantity, - - - -	10
For the second best do. do. - - - -	7
For the best pair of Blankets, not less than 8-4 wide and 10-4 long, - - - -	6

For the second best do. do. - - -	4
For the best Woollen Knit Hose, not less than 12 pair in number, - - -	5
For the second best do. do. - - -	3
For the best Worsted Hose, not less than 12 pair in number, - - -	5
For the second best do. do. - - -	3
For the best Men's Half Hose (woollen) not less than 12 pair in number, - - -	4
For the second best do. do. - - -	2
For the best Men's Woollen Gloves, not less than 12 pair in number, - - -	5
For the second best do. do. - - -	3
For the best Linen Diaper, 5-8 yard wide, and not less than 30 yards in quantity, - - -	5
For the second best do. do. - - -	3
For the best 4-4 yard Diaper (for table linen) not less than 30 yards in quantity, - - -	10
For the second best do. do. - - -	5
For the best specimen of Sewing Silk, raised and spun in this state, of good fast colours, not less than one pound, - - -	5
For the second best do. do. - - -	3
For the best Linen Cloth for Shirting or Sheeting, one yard wide, and 25 yards long, - - -	8
For the second best do. do. - - -	4

All the above Manufactures, when of wool or flax, must be of wool or flax of the growth and manufacture of the state of Massachusetts. And all Manufactures, when presented, must have a private mark.

For the best Butter, not less than five tubs, nor less than 50 pounds each, - - -	10
For the second best do. do. do. - - -	5

It is understood, that whenever, merely from a want of competition, any of the claimants might be considered entitled to the Premium, under a literal construction, yet

if, in the opinion of the Judges, the object so offered is undeserving of any reward, the Judges shall have a right to reject such claims.—Persons to whom Premiums shall be awarded, may, at their option, have an article of Plate, with suitable inscriptions, in lieu of money. Premiums will be paid within ten days after they shall be awarded.

The Trustees of the Massachusetts Society for Promoting Agriculture, hereby give notice, that they intend, on the second day of the Cattle Show, viz. on the fourteenth day of October next, to give Premiums to the Owners and Ploughmen of the three Ploughs, which shall be adjudged, by a competent Committee, to have performed the *best work with the least expense of labour*, not exceeding half an acre to each Plough, and of such depth as the Committee shall direct.

The first Plough,	\$ 20	Second Plough,	\$ 12
Ploughman,	10	Ploughman,	6
Driver,	5	Driver,	3
Third Plough,		\$ 3	
Ploughman,		4	
Driver,		2	

In each case, if there be no Driver, both sums to be awarded to the Ploughman.

The persons engaging in the Ploughing Match, must own their respective Ploughs, and Cattle; and the Ploughman, (if he be not the owner) must be a man employed on the owner's farm.

The persons intending to contend for the Prizes, must give notice in writing to S. W. POMEROY, or GORHAM PARSONS, Esquires, of *Brighton*, on or before the first day of October, so that proper arrangements may be made for the purpose. No person will, on any consideration, be admitted without such notice. The competitors will also be considered as agreeing to follow such rules and regulations as may be adopted by the Committee appointed on

the subject. The Ploughs to be ready to start at 9 o'clock, A. M.

The result of the last Ploughing Match at Brighton, and the satisfaction expressed by so many of their Agricultural brethren, will induce the Society to continue these Premiums annually, in connexion with the Cattle Show ; as an efficacious means for exciting emulation and improvement in the use and construction of the *most important instrument* of Agriculture.

Persons intending to offer any species of Stock, or any Article or Experiment whatever, for Premium, are requested to give notice thereof, either by letter (post paid) stating the Article or Experiment, or to make personal application to Mr. JONATHAN WINSHIP, at *Brighton*, on or before the twelfth day of October, and requesting him to enter such notice or application ; so that tickets may be ready at nine o'clock of the thirteenth. No person will be considered as a competitor, who shall not have given such notice, or made such application for entry, on or before the time above specified.

The applicant's will be held to a rigid compliance with this rule relative to entries, as well as to the other rules prescribed.

The examination of every species of Stock (except Working Oxen) and of Domestick and Household Manufactures, will take place on the thirteenth ; and the trial of Working Oxen, examination of Inventions, and Ploughing Match, on the fourteenth of October.

By order of the Trustees,

JOSIAH QUINCY,

Chairman of Committee of Premiums.

December, 1817.

[The following communication from the Hon. John Welles, Esq. was not received till the foregoing work had been put to press, which must be our apology for its appearing in this place.]

[To the Corresponding Secretary.]

SIR,

I do not expect to impart any thing new to the intelligent farmers of our country, but still as the crop of hay must ever be an important subject to the cultivator; and as the success of the following experiment was very gratifying, I am induced, at your request, to submit it for publication. If it induces others to drain their low lands, and make them more productive, I shall reap much satisfaction therefrom.

I have on my farm a flat piece of low land, of about twenty acres. This has been to me, and to my predecessors for more than half a century, of less value than has been expended in mowing the alder and other bushes, which had overrun the ground. The difficulty of draining, for want of a sufficient descent, had discouraged any thing being done to effect any improvement. Although I had occasionally seen some instances of low land thrown into beds, by intersecting ditches, yet the universal practice of this mode of taking off the water, and producing forward vegetation on the Banks of the St. Lawrence, and its apparent good effect, induced me to make the experiment. I accordingly, in a dry time, in the fall of the year, 1814, broke up about four acres of this land. The soil was of a black meadow mould. The under stratum sand and clay mixed, making a hard pan. As the furrows turned over very smooth, except in some places where it was strong, the land was left till the next year, 1815. When it became sufficiently dry, the sod was found more rotted than was expected. About 12 bucks of manure to the acre were carted on and spread, and the harrow was, at different times, passed over the ground

during the summer and fall of the year. The usual wetness of the soil had discouraged the expectation of raising any crop from the ground. In the latter part of the fall, a large central ditch was opened through the whole piece, corresponding to the descent therefrom. Furrows were then ploughed at suitable distances, and the ground from them thrown upon the beds, which were made about 20 feet by 60. This admitted a more early ploughing in the summer of 1816. It was then laid down with herds'-grass and clover seed. About half a bushel of the former, and four pounds of the latter to an acre. A few oats were sown therewith, which gave a common crop, and were cut for fodder. As the land had not been highly manured, and the experiment promised very favourably after taking off the oats, a coat of manure was put on, of about 12 bucks to the acre; and, it being an object to prevent the evaporation of the manure (as this was done early in the dry season) as well as to have the land left smooth, and descending towards the ditches, they were ploughed anew, and the earth in them thrown upon the beds. In the past spring, 1817, the grass made an appearance of most exuberant fertility; the herds'-grass became very thick, and before mowing, measured, much of it, over five feet. The clover was well set.

Several of my neighbours thinking the crop greater than they had seen, wished to have the produce per acre ascertained. I accordingly had three parts, or pieces, in no respect differing essentially, if at all, from the rest, measured by a careful surveyor, Major C. Adams of Needham, and the crop therefrom was sent to the town's scale and weighed. The hay was perfectly well made, and the result was as follows. The certificates of which are herein enclosed.

I am, Sir, with much respect,

yours, &c.

JOHN WELLES.

Sixteen thousand one hundred and fifty-two square feet, equal to fifty-nine and one-third rods, produced one ton, ten hundred, and three quarters, equal to four tons, two hundred, three quarters, and two pounds per acre.



AN ESTIMATE OF MEASUREMENT AND WEIGHT OF HAY ON THREE PARCELS OF LAND, BELONGING TO JOHN WELLES, ESQ. DORCHESTER, JULY 21, 1817.

Westerly piece, 253 by 24 feet, equal to 6072 square feet. Produce 10 hundred and 3 quarters hay, equal to 3 tons, 17 hundred, and 13 pounds to the acre.

Middle piece, 252 by 19 1-2 feet, equal to 4914 square feet. Produce 9 hundred of hay, equal to 3 tons, 19 hundred, 3 quarters, and 3 pounds to the acre.

Easterly piece 252 by 20 1-2 feet, equal to 5166 square feet. Produce 11 hundred of hay, equal to 4 tons, 12 hundred, and 3 quarters to the acre.

WHOLE QUANTITY OF LAND AND HAY ON THREE LOTS.

16152 square feet, equal to 59 1-3 rods, produced 1 ton, 10 hundred, and 3 quarters of hay, equal to 4 tons, 2 hundred, 3 quarters, and 2 pounds to the acre.

This may certify, that I measured the above parcels of land, and the results were as above described; the average product of the three pieces, being four tons, two hundred, three quarters, and two pounds to the acre, as calculated from the tickets of Messrs. Cranes, the town-weighers of Dorchester.

C. ADAMS.



The smallest of the premium oxen, owned by Colonel Chapin, has been killed, and the weight of the four quarters, hide and tallow, was 1323 pounds. The whole weight, including the offal, 2320.



MASSACHUSETTS

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No. II.

OF THE DISSEMINATION OF PLANTS.

[From the French of Monsieur F. Brisseau Mirbel.]

By dissemination, we mean to express the spontaneous dispersion of the seeds of the vegetable creation ; an event, which, while it brings to a close the yearly round of the vegetative functions of the individual, becomes the means of giving perpetuity to its race. When completed, the organs of the plant in which existence surpasses one year, tend visibly to a state of inactivity, and in that where this concludes with the year, to decay ; being then in fact the first stage of dissolution. When we see the fruit separate from the parent stem, its seams begin to open, the ligatures of the seed detach themselves from the placenta, we are not to place these appearances to the account of the energy of the vital principle, but, on the contrary, to view them as the certain indications of its having ceased in that portion of the vegetable, where they occur. Fruit undergoes the destiny of the leaf in autumn, and is quickly reduced within the control of those laws which govern all inorganic matter. If of a succulent, pulpy nature, the fluids ferment and turn sour, the texture collapses, and the whole is dissolved by putrefaction ; if of a ligneous, dry consistence, it follows precisely the course of the wood or the leaf, in which vegetation has ceased.

In animals, the affection they bear their offspring, the instinct they are endued with for its protection and succour, their strength, their courage, their address, are all so many means of ensuring the perpetuity of their races; but to vegetables, sensation and the sources of spontaneous movement, have been denied; and yet even here we see countless races appear before us on each revolving year, such as they appeared in the first days of their formation. Let us turn our attention to the causes of this wonderful stability in the races of vegetables.

The most efficient is without doubt the prodigious fecundity they are endowed with. Sir Kenelm Digby tells us, that the fathers of the congregation of La Doctrine Chrétienne at Paris, had in their possession, about the year 1660, a single barley-plant with 45 straws, producing in the aggregate 18000 corns of barley. Ray counted 32000 seeds in the heads of one plant of poppy, and 360,000 on one tobacco-plant. Dodart recounts of an elm, that it produced 529,000 seeds. Yet none of those vegetables are among those of the foremost ranks, in the degrees of fecundity. The number of seeds borne by a plant of Begonia, or Vanilla, but above all by a fern, confounds calculation.

Although many kinds, like those of angelica, fraxinella, and coffee, quickly spoil, and require to be sown almost as soon as ripe, yet the far greater proportion preserve the germinating faculty for years and even for ages. Home sowed, with success, barley that had been gathered for 140 years. Wheat has been discovered in subterraneous hoards, which had been lost and forgotten for time out of mind, in as perfect a state as the day it was reaped.

Insects, birds, and four footed animals are the great destroyers of seeds; yet their abundance is such as prevails over the voracity of their consumers; while some are defended from all risk by the hardness of their coverings, or the thorns which arm them, or the acrid and corrosive juices with which they are impregnated.

Spontaneous dissemination favourable to the development of individual plants, by preventing the too great accumulation of seed within a too narrow compass, is carried on in various ways. In the balsam, catechu, fraxinella, sand-box-tree, &c. the valves of the seed-vessel open with a spring that projects the contents to a distance from the parent-plant. The gourd of the spirting cucumber, by a contraction which takes place at the moment of its fall, darts out the seed along with a corrosive fluid, by a vent formed as it quits the stalk. The seed of the wood-sorrel is contained in an extensile arillus or separate pouch, which dilates as the seed-vessel grows, but at last the power of extension ceases in the pouch, when it bursts and shoots out the seeds by an elastic effort. Plants of a lower degree, in the scale of organization, such as mushrooms, have their peculiar means of dissemination of the particles destined for their reproduction. For instance, some of the species of *Peziza* impart a vibratory motion to the cap or cover which bears their seed when that is ripe. Puff-balls, also of the mushroom-tribe, burst at the top like the water of a volcano, and the seed is in such quantity, and so fine, that when it escapes it has the appearance of smoke. The capsules of ferns likewise open with a spring, or effect of their contraction in drying up when ripe. A like cause gives motion to the cilia, or inner fringe which surrounds the urns or seed-vessels of mosses. But although such partial phenomena may attract our curiosity, they act only a very subordinate part in the grand total of dissemination. There are other more general and powerful causes to be mentioned in this place.

Man, seeds are as fine and volatile as the dust of the Anther; the winds carry these away to scatter them on the plain, the mountain, the building, and in the very depth of the cavern. No place seems closed against the intrusion of the impalpable seeds of the various sorts of moulds (*mucores*.)

Heavier seeds and fruits are furnished with wings, which support them in the air, and serve to waft them through great distances. The seed-vessel of the elm is surrounded by a circular membranous wing; that of the ash is terminated by one that is oblong. The keys, or seed-vessel of the maple, has two large side-wings. The seeds of the fir, the cedar, and the larch are furnished with a wing of great fineness. The peduncle of the capsule of the lime-tree adheres to a kind of broad bracte, which plays the part of wings.

The seeds of syngenesious plants are furnished with a feathery crown, or aigrette, and look like small shuttle-cocks. The separate threads that compose this aigrette, distending as they dry, serve as levers to lift the seed from the involucre that holds it, and when out, as a parachute to prevent it coming to the ground, and to buoy it in the air.

Linnæus suspects that the *Erigeron canadense* came through the air from America to Europe, not at all an impossible thing. When once that syngenesious plant has found its way into any quarter, it is sure to dispense and sow itself round the whole neighbourhood.

The funiculus (a cord which attaches the seed to its receptacle) of the dogs-bane, swallowwort, periploca, &c. the calyx of several of the valerians and scabiousses, form of themselves elegant aigrettes, resembling those of the seed of the syngenesious plants.

Seeds are often carried by eddies of winds far from the spot on which they grew. Whirlwinds have been known to scatter over the southern coast of Spain, those that had ripened on the northern coast of Africa.

Some fruits are closed hermetically, and so constructed as to swim on the water. These are carried to every distance by torrents and rivers, as well as the sea itself. Cocoa-nuts, casheu-nuts, and the pods of the mimosa *scandens*, sometimes of the length of two yards, with many other fruits of the tropical regions, are cast upon the shores of Norway, in a state to vegetate, did the climate permit.

Regular currents transport the large double cocoa-nut of the Sechelles, to the coast of Malabar, at the distance of 400 leagues from whence it was produced. Fruits brought by the sea have sometimes discovered to uncivilized nations the existence of those islands which lie to the windward of their country. By such tokens Columbus, in the search of the American continent, was apprized that he was not far distant from the land of which he had prognosticated the existence.

Linnæus remarks, that animals cooperate with great effect in the dissemination of seed.

The squirrel and cross-bill, are both very fond of the seed of the fir; to open the scales of the cones, they strike them against stones, and thus set free and disperse the seed.

Crows, rats, marmots, dormice, convey away seeds to stock their hoards in out of the way places. These form their winter stores, but are often lost or forgotten, while their contents come up in the spring.

Birds swallow the berries, of which they digest only the pulp, but void the stones entire and ready to germinate. It is thus that the thrush and other birds deposit the seed of misletoe on the trees where it is found; and indeed destitute as this is of wings or aigrettes, it could not be disseminated in any other way, for it will not grow on the ground.

The poke of Virginia (*Phytolacca decandra*) which was introduced by the Monks of Corbonieng into the neighbourhood of Bordeaux, for the sake of colouring the wine, has been since disseminated by the birds throughout the southern department of France, and in the deepest valleys of the Pyrenees.

The Dutch, with the view of monopolizing the trade of nutmegs, extirpated the trees on those islands which they could not watch so narrowly as the rest; but in a short time these very islands were restocked with nutmeg

trees by the birds ; as if nature refused to admit of such encroachment on her rights.

Granivorous quadrupeds disseminate the seed they do not digest. It is known to every one, that horses infect the meadows with new weeds. The fruit of the prickly-seeded scorpion-grass, of olearus or goose-grass, of the wood-samicle, are all provided with small hooks, by which they lay hold of the fleeces of the flock, and accompany its migrations.

There are particular plants, such as the pellitory of the wall, the nettle, and the sorrel, that may be said to seek the society of man, and actually to haunt his footsteps. They spring up along the wall of the village, and even in the streets of the city, they follow the shepherd, and climb the loftiest mountains with him.

Distances, chains of mountains, rivers, the sea itself, are but unavailing barriers to the migration of seed. Climate alone can set bounds to the dispersion of the vegetable races ; that only draws the line which these cannot transgress. In process of time, it is probable that most of the plants which grow within the same parallel of latitude will be common to all countries comprised in the entire zone of it ; an event which would be one of the greatest blessings resulting from the industry and persevering intercourse of air to all nations. But no human power will ever force the vegetable of the tropic to endure the climate of the poles, nor *vice versa*. Here nature is too strong for man.

Species cannot spontaneously spread themselves from one pole to the other, the intermediate differences of temperature preventing such progress ; but we may assist in transporting them, as we have done successfully in various instances. We have already transplanted the eucalypti, the metrosidera, the mimosas, the casuarianæ, and other plants of Terra Australis, into our own soil ; while the gardens of Botany Bay are stocked with the fruit trees of Europe.

The dissemination of seed completes the round of vegetation. The shrub and the tree are bared of their foliage; the herb is dried up, and returns to the earth from which it came. That earth appears to us as if stripped for ever of her gay attire, yet countless germs wait but the stated season to re-adorn her with verdure and bloom. Such is the prodigal fertility of nature, that a surface of a thousand times the extent of that of our globe, would not suffice for the seed harvest of a single year, provided the whole was suffered to re-appear; but the destruction of seed is endless, only a small portion escapes to rise again. In no way in our view are the powers of nature and the immutability of its laws more strikingly displayed, than in the successive resurrections of the types of by-gone generations.

ON THE DEATH OF PLANTS.

Plants, like animals, unless destroyed by disease or casualties, are doomed to die of old age.

In many of the *mucor*es (plants which constitute mouldiness) byssi, and mushrooms, the verge of life does not extend beyond a few days, or even hours.

The herbaceous plants we call annuals, die of old age considerably within the term of a year. In our climate, their death takes place on the approach of winter. But we are not on that account to conclude, that cold is the primary cause of the event; a milder climate would not have protracted their existence. Plants of this nature, which grow under the line itself, are scarcely longer lived than those which grow in the regions bordering on the poles. In both situations they perish when the propagation of the species has been secured by the ripening of the seed.

In the herbaceous plants we call biennials, only leaves make their appearance in the first year. These generally die away when the winter comes; in the spring a new foliage, the fore-runner of the flower-stem, is evolved. The

blossom soon appears, this is followed by seed, after which the biennial dies in the same way as the annual.

In the herbaceous plants called perennials, the parts exposed to the action of the light and air, perish every year after they have seeded; but the root survives in the ground, new stems are thrown up in the following spring, and blossom, and seed is again produced.

In the generality of woody plants, death does not supervene until the process of fructification has been repeated for a greater or less number of years. There are trees, however, belonging to the monocotyledonous class, as the sago-tree (*sagus farinifera*), the umbrella-tree (*corypha umbraculifera*), with immense fan-formed leaves of eight or ten yards in length, which only bear fruit once, and then die; but, on the other hand, in the dicotyledonous class, there are enormous trees, whose existence seems to date from before the records of history, and which, in spite of their antiquity, are loaded in each returning year with blossom and seed.

If we were to view the perennial and the woody plants as simple individuals, as such we should be naturally induced to conclude, that unless destroyed by disease or casualties, they were free from the liability to death from old age; but a due consideration leads us to distinguish in every perennial and woody plant, the new part which actually lives and grows, from the old which has ceased to grow and is dead.

I will state this in a broader way. Plants of this nature, have two modes of propagating their races; one by seeds, the other by a continuous evolution of the like parts.

In the first case, the seed presents us with an embryoplant, a new and different individual, independent and unconnected with that from which it derived its existence; in the second case, we are presented with a series of individuals, which issue from the surface, the one of the other, in an uninterrupted sequence, and in some instances con-

tinue permanently united. But whether individuals of this description are produced by seed or continuous evolution, it is certain that they escape, in neither case, the influence of time. While the succession of individuals, or what we may call the race, produced in either of the ways, is, on the other hand, as clearly beyond the reach of age, and will endure until destroyed by some extraneous cause.

We will endeavour to show how these general laws apply.

All the parts of the young herbaceous annual are susceptible of enlargement; the cells of the tubes, at first very small, are soon after extended in every way; in process of time, their membranous walls, fortified by the absorption of nutritious juices, grow thicker, and lose by degrees their original pliancy. The membranes once hardened, excitement ceases to be produced, and the vital functions are at an end; nourishment is no longer drawn, growth is at a stand, and the plant, unable to resist the ceaseless attacks of the external agents employed by nature for its destruction, decays in a short time.

Similar causes induce similar results in the stems of the herbaceous perennials; but there the root is regenerated by a succession of continuous evolutions.

By renewals of the same nature, the life of shrubs and trees proceeds. In these the *liber* or inner bark represents the herbaceous plant, and has like that only a short period of vegetative existence. For when vegetation revives in the woody plant on the return of spring, it is because a new liber, endowed with all the properties of a young herbaceous plant, has replaced under the cortex or rind the liber of the preceding year, which has hardened and become wood.

The yews of Surry, which are supposed to have stood from the time of Julius Cæsar, and are now two yards in diameter; the cedars on Mount Lebanon, nine yards in girth, from the measurement of the learned Labillardiere; the fig-tree of Malabar, according to Rumphius, usually

from sixteen to seventeen yards round; the stupendous chesnuts on Mount *Ætna*, one of which, Howell tells us, measured seventeen yards in circumference; the *Ceibes* of the eastern coast of Africa, of such bulk and height that a single stick is capable of being transformed into a pirogua or sailing vessel, of eighteen or twenty yards from stem to stern, and of three or four in the waist; the baobab of Senegal of ten or twelve yards in girth, and, according to the computation of Adamson, 5 or 6000 years old; all of these, giants as they are, vegetate, as does the smallest bush, solely by the thin herbaceous layer of the liber annually produced at the inner surface of their bark. The concentric layers of preceding liber constitute the mass of the wood, a lifeless skeleton, serving solely to support the new formed parts, and to conduct to them the juices by which they are fed; nor is it even necessary for these functions, that this should be an entire state. Willows and chesnuts, when quite hollow at the heart, still continue to grow with vigour; but in their soundest state, strip them of their bark, and they quickly perish.

Thus reflection teaches us, that the long life of the greater part of trees, and the immortality which at first sight appears to have been imparted to others as well as to the whole of the herbaceous perennial plants, form in reality no exception to the general law which destines every organized individual to perish in determined course; since we see that the old parts of the roots of the herbaceous perennial continue constantly to die away under ground, and are succeeded by new ones, and that the concentric layers which constitute the wood or heart of the trunks of trees, are no other than the accumulated remains of by-gone generations, in which vegetation and life are entirely extinct.

This appears to us the true view of the nature of the life and death of such beings, as are constantly regenerated by the successive evolutions of like continuous parts.

And we may observe, that the liber which is formed on the stem of a tree of centuries old, if the tree has met with no accidental injury to affect its health, enjoys the vegetative power in as full force as the liber which is formed on that of the sapling; and that a sound well-grown scion, from the aged, but healthy tree, affords as good a cutting for propagation as that taken from the young one, so that the race might be perpetuated by cuttings alone, without the assistance of seeds. From this we are entitled to conclude, that according to the course of nature, the progress of regeneration by continuous evolution would never be arrested, if the overgrown size of the branches and stem, the hardening of the wood, and the obstructions of the channels which permeate it, did not impede the circulation of the sap, and consequently its access to the liber.

In fine, what we call death by old age in a tree, to speak correctly, is the extinction of that portion of a race, which has been carried on by continuous evolution; the inevitable result of an incidental death in the liber occasioned by the privation of nourishment.

The life of trees has been commonly divided into three stages; infancy, maturity, and old age. In the first, the tree increases in strength, from one day to the other; in the second, it maintains itself without sensible gain or loss; in the third, it declines. These stages vary in every species, according to soil, climate, aspect, and the nature of the individual plant. The common oak usually lasts from 6 to 900 years, and the stages of its existence are of about 2 or 300 years each. It has been observed to live longer in a dry than in a wet soil. The same may be said of the chesnut.

Every species in order that it may attain to its due growth, requires a certain temperature to be found within limits of a greater or less extent.

The common oak, the fir, the birch, &c. thrive most towards the north; the ash, the olive-tree, &c. in the

warmest parts of Europe; the baobab, the ceiba, and the palm, flourish and become robust no where but between the tropics.

According to Sir Humphrey Davy, the respective quantities of carbon, furnished by different woods, afford a tolerably exact scale wherewith to measure their longevities. Those in which carbonic and earthy substances abound, are the most lasting; and those in which the largest proportion of gaseous element is found, are the least so. This rule may hold good in regard to our indigenous trees; but I doubt whether the baobab, the ceiba, and many other tropical trees, the wood of which is of a loose and soft texture, will afford from masses of equal size, the same proportion of carbon as our oaks, chesnuts, or elms, although they grow to a much greater age.

Sir Humphrey Davy is also of opinion, that trees of the same species grow to a more advanced period in the north than in the south, as cold guards against fermentation and dissolution of parts; but every tree lives the longest when it is in that climate which is the best adapted to its nature. Sir Humphrey's opinion would be unquestionable, if the vegetable species in view were organized so as to be adapted to grow in all the climates of the globe, and it was then found that their duration was constantly greater towards the poles than towards the line. I do not doubt, that more oaks of a great age, and more firs also, are found in the north than in the south of Europe; but it is, on the other hand, beyond a doubt, that the ashes of Calabria and Sicily are longer lived than those of Prussia and Great Britain. These are phenomena which depend upon the particular nature of species, and of this subject we know nothing.

In proportion as a tree increases in size, the vessels of its ligneous layers become obstructed, and the sap circulates with less freedom; hence absorption and secretion decrease after youth, in proportion as the bulk of the tree

is enlarged. The liber is less vigorous; the buds and roots become fewer and feebler; the branches wither; the stem decays at the head; water settles in the injured parts; the wood moulders away. Ere long, the new liber, the annual herbaceous part of woody vegetables, loses the power of completing its regeneration, new parts are no longer evolved, and the tree perishes.

The tree after death is overrun by pucciniæ, mucores, sphaeriæ, and other cryptogamous plants; it attracts and imbibes moisture, no longer as formerly by the absorbing power of its organs, but by the hygrometrical property it derives from its porous conformation, and the chemical action of the elements which compose it; the oxygen of the atmosphere consumes a part of its substance, some water is generated, carbonic acid gas is disengaged; and the rest is resolved into vegetable mould (humus,) a fat, brown, powdery substance, eminently fertile, in which we find in different proportions the same elements of those of which vegetables are composed, and which have the faculty of decomposing air and combining with its oxygen.

It is thus the career of plants is terminated in the order of things. The earth they adorned in the period of vegetation, is fertilized by their remains; germs impregnated with new life have already been confided to its bosom, ready to supply the by-gone generations, and through the death of individuals, an unfading youth is secured to the race.

Norfolk County, June 16th, 1818.

[To the Corresponding Secretary.]

DEAR SIR,

IT is to be regretted that the Farmers in the neighbourhood of the town of Boston are less careful of their or-

chards than of vegetables in their gardens. I am led to this remark from having for many years observed the apple trees in almost every direction, to be very much neglected, in many places, they are in a state of rapid decay, and in others so badly pruned, that the young trees will soon be in the same situation with the older ones.

The cause of this evil is, as I conceive, three fold,—first,—the season that our farmers choose for lopping their apple trees is a bad one, they generally begin in March, when there is still much wet and frosty weather, of no activity in the sap of the tree; of course the water and frost together soon destroy the fresh bark round the cut, and decay begins at once. This season is chosen in many instances because the farmer can spare the time better in March, than in April and May; and in some, because people have an idea that trees must not be cut in summer, believing them more liable to injury then, than in the early parts of the season, but the reverse of this is the fact, as may be proved by any man who will try the experiment on one or two trees in his orchard. Let a farmer take two small apple trees, and prune one in March, and the other in May, and put compost on neither, and he will soon see the difference, the one lopped in May will, if properly pruned, heal over sound and fair, and cover the whole wound in a much less time than the one lopped in March, provided the wounds be of equal size; and of course the tree will be preserved in a sound state much longer, because the wood is exposed to the effects of wet and frost much less time, and the cause of its decay is removed or shut out; but whether trees be pruned in *March*, or *May*, is of little consequence, if they are not *properly pruned*.

Second.—The old practice of *hucking* and mutilating apple trees in a manner ruinous to their orchard, is still, I am sorry to see, followed by some men who are otherwise good husbandmen. As I have witnessed the fact this

spring from a man who is esteemed one of our best farmers, and who is certainly one of the best men, I have thought a communication on the subject might be serviceable to *some*, if not to all who read it. The same reasons which apply to the apple tree, apply to all other trees, except those which are liable to gum; but in a less degree, as the apple tree wood is more subject to canker than almost any other.

It may be objected to pruning in May, on two grounds, one, that the trees are then in blossom, and the other, that in going over the orchards, which are generally mowing land, it would injure the grass; to the *first* I answer that, any time before the 15th of May the blossoms are not open, and of course it cannot injure those that are *not* cut off, and it is of no consequence whether the limbs be cut off before or after the blossom shows itself. To the *second* I should concede the point, that where the orchard is intended to be mowed, it will be better to prune late in April, or as late as it can be done without injury to the grass, and if the trees, or any of them are to be grafted, both operations may be carried on at the same time, and early in May is the best time for grafting apples.

The old and the middle aged apple trees in the neighbourhood of Boston are in a worse state than any other place I am acquainted with. This is the more surprising, because our farmers derive a great revenue from their orchards when in good order, and they are not insensible to their worth. The cause then must be a want of proper information on the subject, and not from negligent habits.

It is a univereal practice among the old farmers, or old *fashioned* farmers, to mount the tree with a hatchet or bill-hook, and hack off any branch which is in a state of decay, or which is misplaced, about six or eight inches from its insertion, leaving a stump to rot, and to operate as a conductor of the water, frost, and canker into the

mother branch in which it grew, or into the body of the tree, according to its situation. This was done originally from an idea that if you cut close to the mother branch, or to the body of the tree, the rot or canker will seize more readily on its trunk, than if cut at a distance, and that the tree will decay the sooner. The practise has been followed without reflection, and without reason by many; but the error is so obvious, that any man of observation must see it yearly; and any one who doubts may satisfy himself in one season of the incorrectness of the practice, by making his experiments on a young tree.

Whenever the tree is pruned, whether it be in March, April, or May, let the farmer take his pruning *saw* and *sharp* knife or hatchet into the tree. When he has fixed on the limb to be lopped off, he should, if it is large or heavy, first cut it off at some distance from its insertion, to prevent its weight in falling from lacerating the bark at the shoulder whence your final cut is to be; because, this leaves an opening for water to get under the bark, and cannot be easily healed. You may now saw the stump close to the branch from which it proceeds with safety; or if it be a portion of a branch which is to be lopped off, the cut should be down to a sound healthy lateral branch growing from the same limb; or if the limb to be cut off proceeds from the body or trunk of the tree, then it should be sawed close to the shaft. The wood in all cases should be smoothed over, and the edges of the bark carefully pared with your knife or hatchet, so that the water will run off the wound. If the cut be made on a lateral branch, it should be sawed obliquely or slanting so as to leave no dead wood, or wood to die, and in all cases the cut should be on a sound and healthy part of the tree. If the branch on which it is cut, is a healthy and vigorous one, it will heal without difficulty, if pruned the last of April or beginning of May, but if in March, the wound

should be covered with a compost ; but if the wound be large, so as to require several seasons before it can heal entirely, it will be better to apply the compost, whether it be pruned in March or later. The smaller the wound, the more easily it is healed ; the large ones however may be perfectly restored if you cut the rotten wood and dead bark away, smooth over the edge of the sound bark, and cover the whole with the compost I shall mention. It is true, that in very old rotten trees the experiment is not worth making ; but in trees that are still essentially sound, but which have been lopped in the disadvantageous manner before mentioned, it is not too late to try your skill, and you may be sure of restoring your orchards to health and fruitfulness. Cut off all the old stumps down to the sound healthy wood, either on the mother branch, or on the body of the tree, and pare off all the dead or cankered bark, and then apply the compost so as to cover the *whole* wound, and your tree will recover itself in a great measure, if not altogether. Let those who do not choose to go to the labour and expense of restoring a whole orchard, begin with one or two trees, and if they live, they will repent that they did not try it on all. But if the farmers will bestow as much time and labour on this object, as it deserves, they will soon feel the benefits and advantage of the change.

Thirdly. Our Farmers are in the habit of encouraging luxuriant upright branches, to the great injury of the natural horizontal fruit bearing branches, these are very properly called *glutton* branches, because they consume the sap which would otherwise go into the lateral and fruit-bearing branches, and in the course of a few years they leave the fruit branches decaying and decayed,—the Farmer then resorts to his ax, cuts away the dead and dying wood, and leaves the *glutton* in full possession of all the nourishment which the roots afford ; but in return this

voracious member of the orchard gives no fruit until many years, and then they are of an inferior quality.

To prevent this, the cultivator should suppress all the stiff, upright shoots the first year they appear, by cutting them off *close* to the branch from which they issue, taking care not to leave the shoulder of the shoot, as he will in such case have the same duty to perform again; but if the shoulder of the glutton be cut away, the sap will be distributed among the lateral fruit bearing branches, which will be kept in vigour, and continue in a healthful bearing state.

By attention to the foregoing rules, apple trees may be kept in health and soundness fifty years longer than if treated with the severity and harshness they now receive; and the orchard will yield its fruit in greater abundance, and with greater certainty while it lasts.

The compost best suited to cover the wounds of all trees, is a composition of tar, bees-wax and red ochre boiled or simmered for half an hour or twenty minutes together, the proportions which I have used are, a pint of tar into which I put a piece of bees wax as big as an English walnut; when these are incorporated, I scatter a small quantity of pulverized red ochre, say half a gill, and stir them well together while boiling hot or simmering. When this compost is cool, it should be stiff enough to resist the heat of the sun sufficiently to prevent its running, and yet be soft enough to be applied to the wound with a small flat smooth stick, it will last two years at least without requiring to be renewed; it yields to the sap as it issues from under the bark round the wound to cover it, while it continues to protect both the wood and the edge of the bark from water, and of course from decay.

With respect I remain, your's, &c.

A FELLOW LABOURER IN THE VINEYARD.

ON RECLAIMING LOW OR MEADOW LAND.

[To the Corresponding Secretary.]

IT is the duty of every man, whatever may be his occupation, to endeavour to do something *every year* that shall add to the value of *his property* and to his stock of *knowledge*, and thus not only to become a blessing to his own family and connexions but to that community of which he is a member, and to whom he is under many obligations.— It is kindly ordered by Providence, that in trying to attain one of these objects we generally gain the other.— Thus we naturally expect to see that industry, care, system, knowledge, competency, opulence go hand in hand. The merchant, if a man of a good share of common sense, discretion and good fortune, not only increases his estate from year to year, but adds to his knowledge of his particular business, and of commerce in general. The mechanic, while he is honestly and busily engaged in his trade, gains a good living at least, and very frequently a handsome estate, and at the same time adds greatly to his stock of skill,—noticing every improvement in the mechanic arts, as suggested by his own practice and observation, or the remarks and inventions of others. The navigator, if a man of common talents and application, rarely returns from a voyage without an increase of knowledge. He becomes a better seaman, a better agent, knows more of the world, and all this without diminishing, in the smallest degree, his exertions for his own family and fortune.—And shall the farmer alone be stationary? shall the farmer sit down contented, through a long life, and find himself at last at the very point from which he started, as respects both his property and his information? shall agriculture, the surest foundation of the wealth and happiness of nations, be so degraded—be the only calling *in our country*, that does not improve our wealth and our knowledge as a people? It must not be. The farmer, if

he be a good man, will always be respected; if an industrious and careful man, blessed with health, will always have a sufficiency if not an abundance; if a man of common education and observation, will increase, not in agricultural knowledge only, but in his stock of general information.

But waving these general remarks, my intention is, at this time, to confine my observations to the common farmers of our country, and inquire *whether it is not in the power of every one, without any expense but that of a little time, to do something every year to render his farm of more value than it was the year before.* If this can be done, while at the same time his crops and necessary business do not suffer for want of seasonable care, is it not a duty he owes to himself, his family and his country to do it, and should he not be pleased with such hints as may serve to assist him in this laudable purpose?—*what then I ask, can the common farmer, that respectable and numerous class of society, do conveniently and without much expense, to increase yearly the value of their estates, and at the same time pay all necessary attention to the common business of the farm?*

A farmers work, it is said, is never done. So much the better. No man ought ever to be idle. To be idle is generally to be vicious. But though the farmer's work is never done, yet there are seasons of the year when he is not driven, and when he can conveniently turn from the usual work of his farm, and do something by way of improvement. There is scarcely a farmer in Massachusetts who could not, in the course of the year, by a little attention to system, in the disposal of his time, make a piece of stone wall, drain and reclaim a piece of low land, clear up a piece of upland overrun with bushes, plant the seeds of apples, pears, peaches, cherries, &c.—set out and ingraft a few fruit trees, perhaps set out an orchard; increase, by new methods, his usual stock of manure, by

collecting mud, leaves, sods and other articles, by improving his breed of cattle, and, in short, by doing a great number of things which are but too commonly omitted to be done, but which would add very considerably to the value and income of the farm. On each of these improvements much might be said, but my present purpose is to recommend to our farming brethren, such especially who live near a market, where land is of course more valuable, *to reclaim a piece of low or meadow-land, however small, every year*, while he has any, and thus be enabled to get crops, and large crops too, of good English hay, instead of the vile, coarse stuff, which now grows upon it, and which is not worth the trouble of mowing, and is calculated, not to nourish cattle, but barely to keep them alive. The way to do this is so simple, and so well known to every farmer, that it seems needless to attempt to describe it, and yet so little of it is done, though almost all our farms have a portion of this low land, that a description cannot be deemed unimportant, if it be only to call up the attention of people, by placing the subject before them anew.

Almost every farm has more or less of what we here call *meadow-land*, land which is boggy, or full of bassacs, or of cranberry vines, &c. The grass is usually mown for fodder, but is as I have said, excessively mean and coarse. It is scarcely worth the labour of mowing.—Now to render such land the very best on the farm, requires some work it is true, but no labor is better rewarded, and it may be done at a season of the year when the farmer has, if ever, a little leisure, I mean immediately after haying is over; let him then ditch and drain this low land in the best way he can. In most cases there will be found an outlet, and then nothing but making a ditch through the middle is necessary, with here and there a cross ditch, as the case may require. If the surrounding higher grounds be full of springs a ditch, may be necessary round the

edges of the meadow to communicate with the main one. These ditches often serve in place of a fence, which is an important circumstance. After thus ditching and leading off the water, plough up the nearest knoll, or high spot that can be found, whether gravel or sand, or both, and cast it into the meadow, dropping a load in a place, so that after being spread it will cover the land intirely over a few inches thick, say from three to six, as may be convenient, *the thicker the better*. None of the old soil or grass will now be seen. When thus prepared, sow it immediately with grass seed clover and herdsgrass. After this it will be better to bush it in, but this is not essential, as the rains will cause the seed to be covered sufficiently. This is all the first year. If done after haying it will probably be in September, and the grass seeds will come up before cold weather. September is the best month, not only because it is a time of most leisure, and a proper season for sowing the seed, but it is generally the driest time in the year, and the cart can be driven on with ease, and the cattle are in heart. Should the work not be done in season to sow seed so as to have it sprout before winter, the sowing may be omitted till spring. It is nearly if not quite as good. The mud thrown out, in forming the ditches, can be taken to the barnyard for manure, or at a proper time it can be spread over the gravel on the spot. In either case it has considerable value. The summer following there may not be expected a great crop, though of greater value than it ever was before. The grass will get well rooted and the foundation laid for an abundant crop for years to come. The next autumn, that is one year after gravelling, there should be a topdressing of mixed or compost manure, and the summer following there will be as fine a crop of clover and herdsgrass, probably, as could be wished for, and in the following years nothing will be necessary but a topdressing of dung every now and then, and if the coarse grass is not intirely subdued, a lit-

more gravel or sand or soil of any kind. Land which is thus reclaimed, I might almost say, created, has many advantages over common land, and may justly be deemed on the whole the most valuable on a farm. It will never need ploughing, nor will it ever be likely to suffer for want of rain. In a very wet season it may suffer a little. There will be crop enough, but it will be a little coarser. It rarely happens, however, that we have too much rain for our grass crops.

I am aware, that to many people, who have done nothing in this way, this labor of converting meadow lands into English grass land, may seem too great, and even more than it is worth, when done. But let them try it. If they find it to turn out as well as mine has done, they will not regret the effort. I have reduced fourteen or fifteen acres in this way; a little every year as I have found it convenient. The land had been mown for generations, and the crop was of the mean kind I have mentioned. It was not worth twenty cents the hundred. Possibly there might have been a ton to the acre, but I doubt it. Cattle would not eat it if they could get any thing else.— On this land, I have for years cut from one and a half to two tons the acre, of excellent clover and herdsgrass, and believe that in future it will do as well, and require less care than any good land I have. The cost of gravelling and sowing an acre, I cannot estimate. It depends on circumstances, such as the nearness of the gravel, and the necessary thickness of the covering, some grounds requiring more than others. There is considerable labour in it no doubt, but it is to be considered that we do not hire it done as a job. It is done with our own teams, after the meadow hay is off, when the farming business is not pressing, and on such days as can be spared. It must be remembered too, that it makes very valuable land of what was of little or no value before. It is a gain of so many acres, so that whatever the expense or labour may

be we must view it as so much purchase money for the best of land; and this I may venture to say, I believe, that two or three crops will amply repay all the expense, and thus leave the farmer, after that time, as much richer as the value of the land so reclaimed.

I have introduced this subject, because I think it has been overlooked by a great many of our worthy farmers much to their disadvantage, and I have to request that all such will make a small beginning this fall, by way of trial. If they will I am persuaded they will follow it up, as one of the most profitable ways of employing a part of the month of September or later in autumn, or even in winter, as may be found most convenient.

A MIDDLESEX FARMER.



RECEIPT FOR PREPARING SEED-WHEAT, SO AS TO SECURE IT AGAINST SMUT, SO FAR AS SMUT DEPENDS ON THE SEED.

IF the seed be *spotted*, it should first be washed in several clear waters, till the black spots disappear. It is then to be steeped in the liquor immediately to be mentioned.

If the seed be not spotted, it is merely to be soaked in the following liquor:—Make some ley, by putting four pints of water to every pound of wood-ashes, according to the quantity wanted. If to 100 pounds of ashes, 400 pints (or 50 gallons) of water be added, the produce, when strained, will be 30 gallons of ley; to which must be added 15 pounds of quick lime. This will prepare nearly 17 bushels of wheat for sowing.

This liquor, when wanted for use, must be placed in a large tub, and made as hot as the naked hand can bear it. The seed being put into baskets, must now be plunged into it, and stirred with a stick; after which the liquor must be

drained away. The seed must next be laid on a floor, till dry enough to be sowed. If stirred from time to time with a shovel, to prevent its heating, it may be kept without damage for a month or even a year.

The above receipt was published in France about 60 years ago by M. Tillet, and recommended by M. Du Hamel; and still appears to retain its reputation.

Mr. Tull (in a work translated from English into French by M. Du Hamel, some years previously to M. Tillet's publication,) had recommended steeping the seed, in *pure* salt and water; and then adding lime to it. Mr. Tull adopted the brine upon the authority of a story, that about 70 years before he wrote, a cargo of foreign wheat had been sunk near Bristol; and being taken away at ebb tides, was sown and produced healthy crops, when the rest of the English wheat was smutty. Wood-ashes are cheaper than salt, and perhaps more efficacious.

M. Tillet made the following experiment to prove the advantage of his liquor. He prepared 14 beds of sandy earth, mixed with flints; each 22 feet long and five wide, and separated only by foot paths; and sowed five rows of wheat in each bed, on March 29, 1759. The seed was throughout, the same; but for some of the beds, it was prepared as above; for others, it was sown without any preparation; and for others, it was purposely blackened with smut. Messrs. De Jussieu and Le Monnier being selected as commissioners to note the issue, took 45 ears, gathered (in two handfuls) from the wheat artificially smutted; of which one ear only was free from smut. They found every thing healthy, as far as they examined, in the other beds. In some rows, the smutted grain had been introduced for a certain portion of the length, and then the rows were completed out of the other parcels of seed; yet the produce uniformly answered with precision to the seed sown. Thus a close neighbourhood in the grown plants did not communicate the smut, though so much appeared

to depend on the state of the seeds themselves. It is unfortunate, that M. Tillet did not, by his liquor, purge the smut from smutty seed on this occasion, in order that his experiment might have appeared complete. He did this however on other occasions, on a large scale, and with different soils.

The four French gentlemen named here, were members of the French Academy of Sciences ; and all of them respectable, and even celebrated.

To the above receipt, the following hints may be added.

If any of the seeds swim, when first plunged into the pure water, let them immediately be removed ; since such seeds generally produce smutty grain. If left to become heavy by taking in water, they often sink to the bottom, to mix with the other grain. Whoever wishes also to avoid smut, must neither sow in wet land, nor during very wet weather.

SENEX

ESSAY ON SMUT IN WHEAT.

Long as *Smut in Wheat* has existed in New England and some of the Middle States, as well as in various parts of the old world ; and great as has been the damage done by it to crops, to flour at the mill, and to seed ; yet the evil in general has neither been fully understood, nor fully prevented ; nor yet have the remedies which the case has admitted after the attack has taken place, been fully applied. As the District of Maine is formed to be the principal domestic granary of New England, it is proper, after learning all that has been said or done on this subject, that its inhabitants should seek to add to this knowledge ; and afterwards diligently conform their practice to the growing state of their information.

The theories offered as to the *cause* of smut, are not yet in a state to afford the necessary satisfaction.—For example. Some have considered smut as proceeding from *very small insects*. But every insect discovered about a wheat plant, is not therefore either a direct or an indirect cause of smut: since insects may habitually visit the wheat plant, in order to feed upon its coarser parts; or if they produce a disease in it, (and they certainly may produce many,) it may be wholly unlike smut. So easy are mistakes on this-subject, that a fly which devours the Hessian wheat-fly in its maggot shape, has been considered as the *offspring* of the very animal on which it feeds; notwithstanding the Hessian fly has an origin of its own, which is now fully discovered, and notwithstanding the devouring insect has never been proved to taste vegetable food. Before we consider, therefore, a given insect as the cause of smut, we should obtain proofs of the fact from good observers stationed in different countries, and properly aided with glasses.—Again: a *parasitic** plant fixing itself upon the wheat plant, has been spoken of as the possible cause of smut; there being various instances of parasitic plants destroying more or less of the mother-plant on which they grow. But when an opinion of this kind shall be as well supported as that of Sir Joseph Banks, who has proved that a multitude of parasitic funguses or mushrooms sometimes destroy wheat plants, in a mode however totally different from that exhibited by smut; we may pay an atten-

* The word *parasitic* or *parasitical* in a short compass expresses a very important and frequent occurrence in nature. It comes from the word *parasite*; which not only signifies a flatterer, but one who is supported by another. The former word is constantly applied by naturalists either to small vegetables drawing their food out of *living* vegetables on which they reside, or to small animals doing the like by living animals, or living plants. The death of the parts, or of the party yielding the support, often follows.—In the above case, an animal which is parasitic to a *plant*, has another animal parasitic to itself. M. de Beauvois thinks, that he lately discovered in France a parasitic fungus growing on a parasitic plant, which had attached itself to living hemp in a wet season.

tion to this suggestion which it does not at present claim. It is a third opinion, that smut is a mere *disease*; and M. Aimen (correspondent of the French Academy of Sciences) held, that it commences with the blossom and prevents the proper formation of the kernel. But notwithstanding that M. Aimen professed to have traced its progress, and was assisted with glasses, as well as with the advice of M. Jussieu, (a celebrated French naturalist;) and that the opinion carries with it considerable probability; yet it still requires the confirmation of other observers in other places, before we adopt it without reserve.—Again: the *black dust* belonging to smut has been held as the *cause* of the propagation of smut. At the same time, however, others consider this black dust merely as the *effect* of smut. M. Aimen attributes this dust to the corruption of certain juices of the plant, originally intended to form the flour (or farina) of the kernel; of which we probably see a correspondent example when certain plumb trees produce puff-balls in the place of fruit. M. Aimen attempted to justify this second opinion of his, by adding water to these juices, and also to the dust of smut; and then comparing the two. But to render this hypothesis more convincing, pure dust should be carefully taken from the *heart* of the kernel, and be rubbed upon pure seed; in order to avoid the eggs, seeds, and infectious matter, which may be supposed to be attached to the *outside* of the wheat.

Such are a part of the theories offered respecting the nature and formation of smut in wheat; but nothing yet named on this subject can be held as properly demonstrated.—We have still, it is true, to look to seasons, soils, and other circumstances, either as being principals or assistant's in the production or progress of the mischief which is the subject of our inquiry. But as we have nothing to report under this head beyond the simple fact, that some of them seem to have an *influence* here, they will be noticed in another place.

In the mean time, we shall state some of the *principles*, upon which it seems reasonable that the preparations for guarding seed wheat against smut should be conducted, in order to correspond with the various speculations prevailing as to the causes of smut.—The principles then seem to be these :

To *remove* or to *destroy* all dangerous animals or dangerous vegetables, as also all contagious matter, connected with the seed wheat, yet without injuring the wheat itself ; also to render the seed wheat nauseous and offensive, that insects from without may be unwilling to visit it ; to accomplish this likewise by processes which are simple, and little liable to accidents, mistakes, or abuses ; to let none of the materials employed in them be dear, scarce, or poisonous ; to adopt methods, if possible, which shall end in giving a stimulus to the growing of the wheat ; to let nothing remain on the wheat kernels, which shall make them stick to each other, and thus embarrass the sower ; and lastly, to let the seeds be left in such a state, as to admit of their being kept for a time without spoiling, in case the sowing shall be unexpectedly delayed, or the vegetation in the ground be checked by the weather.*—Nothing has been said here of the expedient of applying *boiling water* to the seed ; as this great heat probably injures the chit (or germ) of many of the kernels first receiving the water. Besides, an oven may be made to give a much more mild and regular heat ; the washing of the seed taking place in the first instance, or following the removal of the seed from the oven.—Moderate warmth, however, is important in every instance where liquors are employed to prepare seed wheat, that the materials may better penetrate ; but when the *steeping in*

* An attention to the safe keeping of the prepared wheat seed, according to the late Mr. Somerville of Scotland, is often very important, where powerful materials have been employed to act upon it. See communications to the British Board of Agriculture.—2. 219—222.

many cases must be brief, in proportion to the warmth.—The same rule as to warmth applies to waters which are used in succession for *removing* the impurities of seed wheat, merely by *washing*. But nothing, in this case, should prevent a New England farmer from putting some of his wood ashes to his water, or even some soft soap, as strengthening the solvent powers of the water. It is said, that M. Tillet originally designed merely to wash his wheat; and added the ley of wood-ashes to enable the water more easily to dissolve the *cement*, by which he supposed that mischievous matters were fastened to the kernel.

As to the materials adopted for destroying minute insects or vegetables, or contagious particles, supposed to be attached to the kernels of seed wheat, (some of which materials have been made into secrets,) though the number of them appears to be considerable, they may in fact all be classed under a few simple heads. They are certain acids, alkalies, or neutral salts; and certain mineral, animal, or vegetable matters, all of which are held to be corrosive, poisonous, or disgusting. Among the latter articles stand arsenic, blue vitriol, pigeons' dung, soot, stale urine, and certain vegetable poisons. From the nature of the human character, whatever is novel and pompous, will stand a chance of being more admired than what is old and simple: but M. Tillet's receipt agrees with more of the *principles* stated above as worthy of our attention on this occasion, than many of the receipts depending on some others of the materials just mentioned. In particular, we may state as to the destructive powers of his method, that those who make observations with microscopes, find that nothing more speedily deprives small insects of life, than the two alkaline mixtures of lime water and wood-ash ley, when strong; and these articles are equally fatal to minute vegetables; and lime is known of old, to be employed to exter-

minate contagion. But to go still nearer to the point; wood-ash ley and lime-water have been found by *experiment* to prepare seed wheat against smut, equally well with *arsenic*.* If the simplicity of M. Tillet's receipt should still render it despised, we may use to the farmer, the remark made to the leper Gehazi by his servants: "If the prophet had told thee to do some *great thing*, wouldest thou not have done it; how much *rather then*, when he said to thee *wash and be clean*?"

Notwithstanding the propriety of the farmer's obtaining pure wheat for his seed, we see that his crop will often be smutty in defiance of his care, if he omits to prepare this seed; while on the other hand, impure seed sown without any preparation, will sometimes produce for him sound crops. Mr. Aimen gives both ways a close example of the general fact, where no preparation was used. He says that in Guienne (in the south of France,) little smut was seen in the year 1754; yet from the good seed obtained from the crop of 1754, smutty wheat was produced in 1755; and from the bad seed yielded from the crop of 1755 came good wheat in 1756.

Hence we must look to something as having influence here besides the *apparent* state of the seed. What is known on this subject (including what regards *secret* causes of taint attacking the seed) may partly be gathered from the following *Rules* which are either collected from practical observers, or built upon regular experiments. The rules are *twelve* in number, and will probably be found interesting, when their bearings on other subjects in agriculture are taken into account.

1st Rule.—Wheat is not to be sown on ground which has borne smutty wheat in the year preceding. M. de Gouffeville has apparently confirmed this to us by an experiment;—for after sowing sound wheat, both prepared

* See Young's *Annals of Agriculture*, 10. 231.

and unprepared, and then covering it with earth, he strewed smutty materials on the *surface* of the ground over one portion of each parcel. The produce of that portion over which he strewed his materials, became smutty; while the remainder of each parcel, over which no such materials were strewed, continued free from smut.

2d Rule.—Manure tainted with smut is not to be applied to wheat land; it being supposed that a taint may be given to straw, &c. not only in the field and during the act of threshing, but by means of the winnowing machine and of the *sweepings* of a smutty threshing floor.—It is said however by some (and apparently with reason) that such straw, &c. loses its power of conveying infection, after it has been rotted; and this will be particularly true, if the straw has been mixed with *lime* and made into a compost manure.

3d Rule.—When manure is used, it is not to be spread too thickly; and hence it follows, that even when only a due proportion of manure is brought on the land, care must be taken to distribute it very equally. The reason of this rule seems to be, that though an excess of dung makes the leaf and stem of the wheat plant very rank, yet it lessens both the comparative size and comparative produce of the *ear*; which from its state of imperfection, (becomes as in similar cases) open to the reception of smut. The plants, on the other hand, in parts which are without dung, become exposed to smut from their *general* weakness.

4th Rule.—Pure seed is not to be left within the reach of infectious materials.—This caution extends not only to avoiding the use of a threshing floor employed for smutty wheat; but that of tainted sacks, tainted casks, and tainted vessel for measuring wheat.—This infectious matter, however, is not always discoverable by its effects in the *dust* taken from *granaries* in which wheat is preserved; for this dust sometimes has been applied to wheat without infecting it.—In truth, wheat easily collects harmless dust;

and among the rest, the *down* from that end of the wheat kernel which contains the chit or germ. Besides, when infectious materials have for a certain period been separated from wheat, they may possibly lose their infecting power; which if proved to be the case by fair experiment, will confirm the opinion, that old seed is least liable to smut, provided it be still in a state to produce vigorous plants.

5th Rule.—The sowing of wheat should take place early, that the seed may ripen early, smut frequently attending late crops. But it is not merely late *sowing* that is mischievous; for every thing is dangerous which delays the ripening of the crop. Of this description is the practice sometimes seen in cold climates, of feeding down a field of green wheat with cattle, in the hope, that new shoots will be thrown up to ripen themselves at a later period. The same practice, however, is supposed to be harmless in some of the hot countries of the East, where there is always sun enough left to *quicken* the ripening of the grain; or if evil follows, it may be an evil different from smut, which is not understood to be common in such regions. In confirmation of this latter fact, Mr. Tull remarks (what, to a certain degree, is proved by our experience in the United States,) that smut chiefly belongs to cold countries; in which he probably included the mountainous regions of hot countries.—And yet we may observe by the way, that wheat and other similar grains are generally sown early enough in hot countries, to permit them to ripen before the scorching heats commence; that is, in a comparatively cool season. Indeed the experience of Great Britain and Ireland manifests in *some* seasons the possibility of wheat being ripened, when it has scarcely enjoyed a single gleam of sunshine in the latter stages of its growth: just as we see late apples and pears ripen in our dark and cool closets and cellars.

6th Rule.—The seed ought to be well conditioned; for seed which is light, unripe, *mouldy*, very much bruised,

worm eaten, or otherwise imperfect or injured, has, in general, a tendency to produce smutty wheat, and especially in smutty seasons. But since plump wheat will always be valued on account of its producing a large proportion of flour to a small proportion of bran; many will think it right to attempt to obtain such grain by means of *plump seed*. A controversy, however, exists as to the necessity of sowing plump seed; Sir Joseph Banks and other respectable and experienced persons, urging that all the large kernels should be sent to the mill, since small and healthy kernels will supply good plants at a less cost; a bushel of such seed containing most kernels, and therefore yielding a greater number of plants. The late Dr. Hut-ton of Edinburgh, (the celebrated mineralogist) likewise has related, that after he had impoverished the leaves and stems of wheat by sowing it repeatedly from its own seed, during a certain period, on the same bed in his garden; he immediately obtained plants of the proper dimensions and quality, by sowing the last raised seed in a fresh bed. Mr. Tull on the other hand affirmed, that “the largest grained plump fat wheat, is more liable to smuttiness, than small grained thin wheat.” Garden fruits also, which (in consequence of nature being overstrained in some of the parts concerned in fructification) are made to arrive at an extraordinary bulk, often have imperfect seeds; as fat animals are often bad breeders.—Perhaps, therefore, it will be found a wise compromise on this subject to have the seeds of a *natural* size, and so to manage them by culture, as to make them produce kernels larger than themselves.—However, the present rule chiefly regards *damaged* kernels, and not their size.

7th Rule.—None but good land should be employed for wheat, and particularly it should be land admitting of early crops.—Hence wet land should never be applied to wheat, till its wetness is cured.

8th Rule.—Wheat is not to be sown in very wet weather, even when the soil is dry.—This is a rule which rests on several reasons. If the seed be prepared by steeping, water may dissolve or wash off the preparation. If it be not so prepared, the wet may convey to the seed a contagion which was before buried quietly within the soil. Great rains also lay bare the seed, and expose it to various evils and accidents. Such rains also wash down part of the soil above, to fill up the hollow spaces in the soil below, and thus (as the phrase is) *un-till* the ground, and make it so heavy, as to bear ploughing better than sowing. Lastly, much wet injures those parts of the wheat plant which are concerned in forming the seed, by producing rankness in the rest of the plant; and thence lays them open to the attack of smut.

9th Rule.—A change of seed is equally recommended by Mr. Tull and by M. Aimen; and the rule has this in its favour, that few who are wise will procure worse seed to sow, than that which they possess already.

10th Rule.—The purest portions of the wheat plants in a crop, should be set apart for seed; and when ripe, these plants should be harvested by themselves, and also threshed by themselves, as soon as possible; and the seed which is obtained, after it has been first washed with some protecting preparation (like that proposed by M. Aimen) and thoroughly dried, should be preserved apart in a safe place.—This Rule will commonly prove more important than the preceding one.

11th Rule.—The thick sowing of wheat is improper; for the double reason, that it produces feeble plants and dampness, both of which encourage smut.

12th Rule.—No favourable moment for sowing is to be lost, nor is any unfavourable moment to be adopted, from a supposed necessity of paying attention to the state of the moon. The prejudice of certain worthy men, on this subject, arises in general, not from their own experience, but

from traditions delivered from our ancestors, who lived in times so little enlightened, that the moon, stars, and planets were thought to govern the fates and fortunes of men themselves, as well as the success of their crops. The prejudice in question, has been kept alive by many, in consequence of habit, and of their desire of being on the *safe side*; or, if observation has at any time been appealed to, it was to note (as Lord Bacon says of these cases,) only when their rule hit, and not when it missed.—M. Gouffeville, however (about the years 1759 and 1760) divided a piece of land 150 feet long and 50 feet wide, into 22 plots, which were thrown into three classes, each plot having 12 rows, and exhibiting from three to six experiments. His chief object was to prove, that certain circumstances had no share in occasioning smut in wheat; and he found in particular, that the result of his experiments was in nothing changed by the variations in the *moon* or in the *wind*; which he thence recommends us to disregard. Those who think differently, should produce a set of equally extensive experiments on the other side. Indeed it is now the prevailing opinion of enlightened men in most civilized countries, that our observation in Agriculture, as regards the heavens, should chiefly be directed to the time of the year, the actual state of the weather, and the habits of the climate of each place. If any one of the heavenly bodies deserves especial regard in Agriculture, it is surely the Sun, which forms and defines our seasons. As to the wind, Solomon says, “He that observeth the wind shall not sow, and he that regardeth the clouds shall not reap;” thus intimating that we are *to seize the moment before us*, and especially in climates like ours, where all our useful moments are short. But either to delay our proceedings or to hasten them for cold *moon-shine*, is not to keep pace with the solid improvements of the age; but to follow our forefathers in a point of *avowed* superstition. It is better in short to run the chance of sowing twice, than to be certain of sowing either too soon or too late.

So much for our twelve Rules taken *separately*: a part of which will be found to rest on general principles of good farming, and tend to save us from *other* mischiefs besides smut.

Viewing these twelve Rules, and the remarks which introduced them, *collectively*, they next seem to furnish three conclusions. 1st. That our suspicions as to the causes and occasions of smut ought to be directed to a variety of quarters. 2d. That it ought to be a fundamental object to make the wheat plant healthy in all its parts, and particularly in its ear and in its seed. 3d. That from the appearance and disappearance of smut, according to circumstances, we may conjecture, that the rudiments of smut are always at hand and capable of rapid multiplication; thus furnishing a double motive for purifying and protecting our seed.

On the subject of wheat, when under the operation of wet seasons, we may make the following statement from Dr. Darwin, as given in his *Phytologia*. This writer conceives, that the male parts of the flowers of the wheat may burst their cells by means of wet, and throw their fertilizing dust on the earth, or otherwise injure it; or that the rain may wash it away; and that for want of a proper impregnation, the germ, or female part, may become putrid, as in the case of the addled egg. Hence he favoured the plan of sowing together *two kinds of wheat*, flowering at different periods; that if the fertilizing dust of one should be lost, a due quantity (for there is always a surplus of it) might be obtained from the other.—How long the female part of the flower may remain capable of impregnation, after the season of the fertilizing dust of its own male has passed away, has probably been the subject of no experiment yet made known to our agriculturalists. Besides, every concern of this kind ought to be submitted to the test of varied and multiplied attention and trials, at separate times and in different countries.

But to proceed with our general subject.—We shall now suppose that smut has actually *arisen in wheat*, and inquire how it is to be *prevented from injuring our flour at the mill*.

We have already seen one method to be practised on this occasion, which is, that of putting the wheat into water, removing the light kernels, and then washing the remainder. This may be done with water, having in it a little soap or wood-ash ley, to increase its cleansing qualities; and after this has been well washed off by pure water, a *thorough drying* must take place, before the wheat is sent to the mill.—But as this process is troublesome, on account of the difficulty of drying wheat, especially in winter or in wet or cloudy weather; and as washing has been thought to affect the appearance of the grain when offered for sale, the following methods have been proposed as substitutes.

1st Method.—Sand has been mixed with wheat on the threshing floor, to give room for friction from the flail. But there is both trouble in obtaining and in using the sand, and then again in separating it.

2d Method.—M. L'Hommedieu, Vice-President of the Agricultural Society of New York, gives the following as an English receipt.—Take some of the reddest marle or clay, dry it in an oven, reduce it to fine powder, and then sift a pint of it at the time of threshing over every dozen of sheaves, (chiefly at the end where the ears lie.) The red dust, it is pretended, will “predominate and keep the smut from taking effect,” and itself be blown away during the winnowing. (See Transactions of the New York Agricultural Society, I. 314.)

3d Method.—Mr. Davis, who was patronized by the conductor of the farm of George III., used a *powder* for smutty wheat, which was said to operate speedily, and to be more effectual than mere friction, and to clean a *load* of wheat at the expense of a dollar and a half.—Smutted

wheat, valued at 35 shillings a quarter, with mere friction, became worth 40; but was "still only fit for *blues*, of which gingerbread is made;" while a sample, fully wrought with Mr. Davis' powder, became worth about 54. The English Board of Agriculture much praised this discovery. (See their Communications, II. 230.)

4th Method.—The French sometimes take a quilt that is very woolly, on which half a bushel of wheat being laid, the quilt is forcibly shaken by two persons, when the light smutty grain is said to stick to the quilt, leaving the other wheat also brighter. After cleaning the quilt, fresh parcels are shaken. (See *Maison Rustique*: Edition 1775.)

5th Method.—This also is French; and consists in *turning the wheat round* at the mill in a rolling (or cylindrical) screen of pierced sheet-iron, having the rough side inwards.—In this drum-sieve (or *crible a tambour*,) which revolves nearly horizontally, the grain becomes more or less cleansed from its external impurities; but the work is slow. The rolling screen of wire, used in our good flour-mills for separating foul seeds, &c. from wheat, would operate (if its motion were continued) in a similar manner; the down growing over the germ of the kernel of the wheat, being actually removed by it, to the benefit of the flour. But the action in both cases is too feeble for carrying away smut; which lying originally *within* the rind or skin of the wheat, cannot be removed till the rind is forcibly broken.

6th Method.—This consists in employing against smut the small mill-stones used for converting common barley into pearl barley. The pearl barley is prepared by grinding off, not only the coat or rind of the common barley, but part of its kernel; (for some of the coat lies in the longitudinal indent of the kernel.)—The smutted wheat, however, is rubbed for a shorter time than the barley; but the smut, not being immediately carried off, passes in some degree from one kernel to another; this process also is slow, and the stones require frequent cleansing.

7th Method.—The smutty grains are here *crushed* by making the wheat pass between two sets of cylindrical surfaces of thick sheet-iron, placed perpendicularly, one within the other, and almost touching; the inner set revolving, but the outer remaining still.—These surfaces act like graters on the wheat, by having *holes* punched in them; the holes of the one surface pointing to those in the other; and through the two sets of holes passes a strong *current of air* produced by a winnow (revolving on a perpendicular axis) occupying the hollow of the inner cylinder. But for the smut to be *blown away*, as fast as released, the grain must be *dry*. This cheap and rapid operation instantly puts the blackest wheat in a condition to be made into superfine flour: and it also brightens wheat for sale. Sometimes the operation requires to be repeated. The wheat, however, ought to be screened before it enters the smut machine, to remove foreign substances mixed with it; and as the wheat drops from the smut-machine into the trough below, a second winnow must separate from it the light and broken kernels. We must not forget also to direct some of the holes in the external cylinder outwards, to let the smut escape with ease.

Such are the methods by which wheat has hitherto been cleansed from smut, as far as an extensive inquiry has brought them to light.

This Essay on Smutty Wheat will now be closed, with two reflections.

1st. The subject is of immense importance. The United States annually export to the amount of many millions of dollars in flour and in other products of wheat, besides consuming a much larger amount at home and on board their vessels. We saw above, that by removing smut from wheat, its value directly rose 50 per cent; and flour is thus made more agreeable and wholesome in bread and in pastry. But by preventing smut altogether, we shall prevent a dimunition of our crops, much mortification,

and some trouble and expense.—We repeat then, that the subject is immensely important, especially to an agricultural and growing nation.

2d. The name of *smut* has by some been applied to blast in wheat; and it may properly be so applied, as well as to the subject of this Essay, if each evil be considered as arising from the corruption or perversion of the healthy sap. Indeed M. du Hamel, in his *Elements of Agriculture*, classes both under the name of *diseases which render the wheat black*.—It is unfortunate that we have not adopted one of the French names for what we have above called smut; for they term it not only *charbon*, but *les grains brules*, or *burnt wheat*, the grain seeming to contain within its coat nothing but burnt matter. The *Nielle* of the French, or *blast* (by many called *blight*) attacks not only wheat, but barley, oats, spelt, rye, and various other plants, being a disease which injures their blossoms, and prevents the formation of the kernel. Smut also attacks several plants besides wheat; and according to M. Aimen, the disappointed sap extends the skin of the rye and forms ergot; which agrees with the opinion of M. Vauquelin very recently announced in consequence of a chemical analysis, though contrary to that of a Committee of the Institute of France, who think that ergot is a *parasitic fungus*.
SENEX.

P. S. Mr. Arthur Young, in the tenth edition of his *Farmer's Calendar*, published in 1815, says, after discussing the subject of smut: "The conclusion which I draw from the whole is, that steeping the seed many hours in a lixivium made of wood-ashes, or in lime-water, may be *relied on for security*; and of these, the *former* appears to be the most effective. The only doubt that can remain is, relative to the propriety of steeping for a longer period than 24 hours."—But it does not appear that Mr. Young *warmed* his liquor.—When we consider, however, this

gentleman's situation, as Editor of *Annals of Agriculture*, as Secretary of the English Board of Agriculture, as the writer of *Agricultural Travels in France and Ireland*, which which have much improved the Agriculture of both those countries, and as a very old farmer and author, his testimony is invaluable.

It should have been stated in its place, that we ought carefully to remove the *puff ball* (a species of lycoperdon or mushroom) from wheat land, and indeed from a farm; for M. Aimen found, that pure wheat rubbed with this powder, yielded smutty plants!—*Query*. When Mr. Somerville, in his *Essay on the blight and smut of wheat*, speaks of smut-balls, does he consider *burnt grain* as a smut-ball?



REVIEW AND TRANSLATION OF A FRENCH PAMPHLET
 “ON THE APPLICATION OF PLASTER TO ARTIFICIAL
 MEADOWS, BY MONSIEUR CANOLLE, MEMBER OF THE
 ELECTORAL COLLEGE IN THE DEPARTMENT OF THE
 VIENNE, AND OF MANY LEARNED SOCIETIES.”

[By the Corresponding Secretary.]

THIS little work, on a subject which is acquiring daily new interest in this state, from the extended, and constantly extending use of plaster, was among the books lately introduced by the Massachusetts Agricultural Society, for the increase of their library.

It was not because the utility of Plaster, that phenomenon in agricultural discoveries, which baffles the skill of the philosopher and chemist, was doubted in this country, but because its use is still too much confined, and because prejudices on the subject prevail with an obstinacy, which no evidence has yet been able to overcome, that the Editors of this work have been at the trouble of translating this little tract.

For twenty years after plaster was found to have renovated the worn-out lands on Connecticut river, it was received as an axiom settled in Agriculture, that gypsum or plaster was of no sort of use on the sea-board. It was in vain, that you urged that it was found to be very useful in some parts of Great Britain, which may be called *all sea-board*; and that it was particularly beneficial in some countries, which lay along the British channel open to the southwest winds, which sweep the Atlantic from the coast of Brazil to the island of Great Britain; or that it had been used with success on Long Island, on the shore; and more recently, on the very margin of the sea, in the District of Maine. It was in vain that we cited to them the unanswerable experiment of the late Ralph Smith, Esq. of Roxbury, who tried it most successfully on old pasture in that town, on which its effects were visible, as he stated, for seven years. Still one or two, or a few persons, having either the misfortune to use bad plaster, or to apply it to lands not suitable to it, or in too small quantities, or to plants which it is not calculated to improve, having failed of success, they not only reject its use, but endeavour to bring it into discredit.

They cannot succeed in preventing its extension, but they may make it more slow than it would otherwise be, and in this way may do some millions of dollars amount of injury to the state.

As this little brochure, or pamphlet, of Monsieur Canolle's, contains most of the necessary rules, or hints, with respect to the use of plaster, we shall not enlarge at present on the subject, but simply state, with great brevity, some maxims, which, though subject to certain exceptions, may be considered as being generally received as true, in all places where plaster is used, and are more particularly advanced by that eminent philosopher, Sir Humphrey Davy.

1st. Plaster is found to be more useful on dry than on wet soils, particularly on gravelly or sandy loams, or on loams which repose on gravel or sand.

2dly. Though the quantity employed by European cultivators is very different, yet it may be assumed as true, that less than three bushels to the acre, would not be esteemed sufficient to produce any visible effects. Some persons with us have abandoned plaster, because one bushel, or a bushel and an half, did not at once change the character of the crop.

3dly. The effects of plaster are chiefly confined to large-leaved plants, such as clover and lucern. Its operation on the finer grasses is scarcely perceptible. It is not used much in Europe on grain, and, we believe, seldom, if ever, on potatoes.

4thly. Although sometimes its effects are speedy, yet, in general, they ought not to be expected till the second year, unless applied in September or October, for the following spring.

5thly. Some lands in other respects, as to dryness, and the nature of the crop calculated for plaster, are not benefited by it. On analyzing the soil of some such lands, where plaster had failed, Sir Humphrey Davy discovered, that they had already a competent quantity of plaster or gypsum in them; of course, no effect, except an injurious one, that of making the gypsum in excess, could be there expected.

When Monsieur Canolle speaks of *artificial meadows*, he means such as we usually term *mowing lands*, as distinguished from natural wet meadows. The term meadow is generally applied, both in England and France, to all mowing land, or land which is mown, and is put in opposition to, or by way of distinction from, arable or ploughed and pasture land. The translation will be made into the plainest language, adapted to all cultivators or farmers.

TRANSLATION OF M. CANOLLE'S TRACT.

[Introduction by M. Canolle.]

To apply to our meadow lands a manure, which should be efficacious and cheap, and should supply the place of our usual manures, has been the object of my experiments, the result of which I shall now state. The scarcity and dearness of the manures of the country, absorbed chiefly by the culture of the vine [and we may say in this country, of the Indian corn] render meadows, or mowing lands in *this* district [that of Poitiers, in France] of little value. The cultivator purchases, at great expense, the benefit of *hay* for his *stock*, and, in consequence, their number is reduced to what is absolutely necessary for the cultivation of his ploughed lands. Thus, for want of manure, we leave an immense extent of our soil subjected to slight ploughings, and a fallow every third year, scarcely yields a *four-fold* increase. Let us give a value to these barren grounds. Let us augment their produce, and, for this purpose, let us turn them into artificial meadows, or mowing lands, and let us apply to them a substance easy to be procured, little expensive, whose effects are as uniform and as durable as those of our common and most expensive manures.

The application of our home-made manure, upon these dry and barren lands, when in mowing, require an expense, which the produce will not cover, even when your mowing lands are in the most flourishing condition. The following example or parallel, will prove it.

It is well known, that a *boisselée* of land, (or about 200 square toises, which we may compute at one sixth of an acre, which will be exact enough for our present object) converted or turned into mowing ground, cannot be dunged under an expense of seven dollars twenty cents; that the effect of this dunging cannot be perceived more than three

years, and that, during this three years, the crop will not exceed (for this sixth of an acre) 500 weight of hay annually, that is, at the rate of about one ton and an half to the acre.

How can such a crop pay the expense of culture, seed, manure, the interest of the money advanced, and the produce which this same land would have given, if cultivated with fallows in the *usual way*? This will appear by the following statement:—

One sixth of an acre of land hired for thirty cents a	
year, for four years - - - - -	\$ 1 20
Taxes at 7 1-2 cents per year - - - - -	30
Expense of culture to put in saintfoin - - - - -	60
Picking up stones - - - - -	20
Seed - - - - -	80
Manure and carting do. . - - - - -	7 20
	\$ 10 30

Let us suppose, that the sixth of an acre of saintfoin, or clover, gives every year 500 pounds of hay, which does not always happen, and that the saintfoin sells for *five dollars* a thousand weight, or half ton, a thing also very rare, you will only have about seven dollars and fifty cents net produce in three years, and an actual loss of about three dollars on your sixth of an acre of ground. I reckon but three years' harvest, because you can get no produce the first year.

[*Note.* It would seem by this, that in this part of France, they do not lay their lands down to grass with any sort of grain.]—*Editors.*

If, instead of employing a manure, which cost seven dollars twenty cents, for one sixth of an acre, you employ one which costs but one dollar twenty cents for the same land, and which will produce as great an effect as the dearer sort, the benefit will be unequivocal. Instead of expending ten dollars and thirty cents, your cost will be, but four dollars thirty cents, and the loss will be prevented.

There are two principal considerations in estimating manures ; the one is their relative value as to effects, and the other is the cost of carriage and spreading. Thus it is clear, that *that* manure is to be preferred, which, with the *least bulk*, produces the most astonishing effects. I speak of *plaster*.

The application of plaster to agriculture, ought not to be reckoned among the number of seducing and fallacious innovations, which theorists have introduced, and which wise farmers distrust with no small reason. The trials which have established its utility and efficacy, have not been made by a small number of adepts, in a privileged garden. This manure has been known for more than forty years. It was first employed in Switzerland, in the year 1768. Its use was soon adopted in Germany, and afterwards in Flanders and France, principally in Alsace, the Lyonnais, and Dauphiny, where it has been regarded by cultivators, as the surest and most powerful agent, or manure for *mowing lands*. Before employing it at large, I chose to make an experiment, and compare its effects with our common manures.

[This French writer omits, in his enumeration of countries in which it has been tried, the United States, where it was introduced nearly forty years since (very much to the honour of our citizens) soon after it was spoken of in Europe. We take this occasion to mention, that the account of this valuable manure, in the Supplement to the British Encyclopædia, published in 1812, is extremely meagre, and calculated to leave unfavourable impressions. The only reason seems to be, that it had not been much introduced into Scotland. The editors of that work, speak with some doubt of the trials in America, and chiefly quote a very early work of Mr. Powell, of Pennsylvania ; but a very little inquiry would have informed them, that it is a staple export from one or two of their provinces, and that the United States now consume many thousand tons annu-

ally, both of the Nova Scotia and French plaster. They suggest a doubt, whether it can be a cheap manure, even if it could be obtained gratis in the countries where it is found. We can only state that a ton, which costs, after it is ground in this country, not more than thirteen or fourteen dollars, is sufficient to manure at least four acres of land. That its effects are supposed to last at least four years, though diminishing after the second, and, of course, the cost of manuring an acre for four years will not exceed three dollars and an half, not much more than it would cost to cart and spread a proper quantity of dung on the same land. How long plaster would continue to operate beneficially without other manures, is a point not yet, we think, sufficiently established.]—*The Editors.*

MONSIEUR CANOLLE'S EXPERIMENTS.—*First Year.*

I caused to be prepared, in the usual manner, ten pieces of land, each one sixth of an acre, making a part of a larger field, which I intended to lay down to lucern grass, [a grass much cultivated in France, in the same way we raise clover.] This field has about a foot of vegetable earth, or earth fit for vegetables, over a bed of red sand, mixed with clay. The ten pieces were sown with lucern, in the spring of 1807. The seed came up well, and during the course of that year, flourished vigorously.

I divided the ten pieces, in 1808, into seven portions or lots, six of which consisted of one sixth of an acre each, and the rest of two thirds of an acre. In the month of February, of this year, I spread upon each of the six portions of one sixth of an acre the necessary quantity of the usual manure of the country, and kept an account of the expense. This manure was rotten horse dung, dung of sheep and pigeons, soot, ashes and vegetable mould. The quantity of each of these manures, requisite for one sixth of an acre, cost me seven dollars twenty cents, and the plaster for the remaining two thirds of an acre, cost but four

dollars and eighty cents, being but one dollar twenty cents for one sixth of an acre.

The plaster was spread early in April. Now see the effect for the first year. It ought to be remarked, that the year was remarkably dry, and the land was one hundred feet high above the level of a river.

The sixth of an acre, manured with soot, gave 600 pounds of hay.

That with ashes, 450 pounds.

That with sheeps' dung, 400.

That with rotten horse dung, 380.

That with mould, 290.

The least productive piece was that with pigeons' dung, which scarcely gave 200 pounds.

The four pieces of one sixth of an acre each, manured with plaster, gave one ton. Thus the product of the four pieces, manured with *plaster*, which had cost only five dollars, was, within one sixth part, as great as that of the six other equal pieces, the manure of which had cost forty-three dollars.

In 1809, the results of the experiment were different from those of 1803, yet served still further to prove the beneficial effects of plaster. The four parts which had been sown, or manured, with plaster, gave as before, one ton of dry hay (on two-thirds of an acre.) The sixth of an acre, which had been manured with soot, did not give 500 pounds. The other pieces manured as above, gave a much less quantity than the year before. Those that were manured with pigeons' dung and old mould, scarcely gave enough to pay the expense of cutting and curing. Thus, for the year 1809, the advantage remained in favour of the part manured with plaster, which still preserved the same degree of vigour, whilst that manured with soot, which had cost seven dollars twenty cents for a sixth of an acre, and which, the first year, appeared superiour to the plastered land, this year fell below it.

1810. At the beginning of April, in this year, on visiting my experimental field, I was astonished at the vigour of my grass, which had been plastered, and its contrast with the smallness and feebleness of that which had been manured with pigeons' dung, mould, and ashes. Those which had been manured with soot, horse and sheep's dung, still retained some appearances of vigour, which promised some crop. I came to the aid of my suffering and perishing plants, by sowing over them plaster.

The effect soon became apparent. In less than *three weeks*, the vegetation of these plants equalled that of the part originally treated with plaster, whilst the parts manured with horse dung, soot, and sheep's dung, which I left as before, did not give a crop half equal to that of the year before. They promise me but a feeble supply next year, if I do not attempt to assist them.

The results which I obtained from the trial of plaster in the year 1808, decided me to apply it on a much larger scale.

I have laid down to saintfoin and lucern [two favourite grasses of the French] more than fifty acres, and I have employed no other manure than plaster. The crops I have obtained, have equalled those obtained from lands which have been carefully, and profusely, or liberally manured with the common manures of the country, and I can truly affirm, that the prospect of future crops is as good as can be furnished by the best cultivated mowing lands, treated in the common way. The success has surpassed all my expectations. This experiment has not been lost. The example has been followed by many. I can affirm, that more than 200,000 weight of plaster has been employed in this single district, [not more than the hundredth part of France.

After having shewn, by positive and decisive facts, the efficacy of plaster, I shall proceed to state the process employed, both for the preparation and application of this substance.

The first section, on the importation of plaster into Poitiers, we omit.

SECTION II.—OF BURNING THE PLASTER.

This preparation is *necessary* to render plaster fit for the purposes of agriculture. [Here the author is mistaken, as it is never burnt, we believe, in any part of America, where its use has been more general, and its application more successful, than in any other country. Still as some may choose to try the experiment, and as it may, possibly, improve the quality of the manure, and increase its effects, we shall insert what Monsieur Canolle says on this part of the subject.]

“The action of fire deprives the plaster of its *water* of mineralization, for which it afterwards becomes thirsty, and strives to regain it from the atmosphere. By burning, it becomes much more susceptible of pulverization, and, in this state, reduced to more minute particles, and thus, with the same volume, it will cover a greater extent of ground, and more equally. There are two objects to be attended to in burning plaster, to economize fuel and time. You accomplish the former by employing that which is capable of producing the greatest intensity of heat. That which gives the most flame is to be preferred. Dry cord wood, or faggots, were employed by me, and the cost of fuel was about three dollars to three tons of plaster, or a dollar per ton.”

M. Canolle first burnt his plaster in the open air, and it then cost him for fuel, nearly three dollars per ton. After this he made a very simple brick furnace (or it might as well be of stone.) His furnace cost him twelve dollars, and he burnt seven tons of plaster, with two dollars worth of fuel, he made of faggots only. The manner of burning the plaster is very simple, very much the same as that employed in burning lime, and consists in laying the lower tier of stones, consisting of the largest, so as to form an

arch to admit the fuel, and the others are to be so arranged as to admit the flame to pass freely through the whole mass. It requires about eight hours, with a pretty intense flame, to burn it sufficiently. You know when it is fit to be pulverized, and that is, when the pieces of stone in front pulverize easily, which you can ascertain by experiment. The plaster loses in burning about one-fifth of its weight, but it becomes so much more divisible by it, that it will cover one quarter part more land than the same quantity which has not been burnt. Mr. Canolle pulverized his plaster after it was burnt, by beating it with clubs: he also made use of a roller, and afterwards sifted it.

SECTION IV.—CIRCUMSTANCES FAVOURABLE OR UNFAVOURABLE TO THE SUCCESS OF PLASTER OR GRASS LAND.

Plaster acting, or operating chiefly on the absorbent system of plants, its effects are not like those of manures buried in the soil, which act principally on the roots. The latter according to their *particular nature* divide, soften, enrich, warm, or stiffen the soils with which they are mixed. The quantity of plaster spread upon the land is so trifling, that it can have little effect on the soil. I speak from experience. Plaster buried in the earth where saintfoin has been sown, has produced no visible operation; whilst the same quantity of plaster spread over the same surface of saintfoin, has produced the most beautiful vegetation.

From this experience, so uniform in the application of plaster, I am led to believe, that one must consult as well the nature of the soil, as the kinds of plants to which we apply plaster. Thus, whatever may be the soil on which clover, lucern, and saintfoin naturally flourish vigorously, or with that vigour which encourages us to apply manure, there is no risk in trying plaster.

It is to be remarked, that plaster operates on plants in a direct ratio, to the size and number of their leaves. I

have spread plaster on land where saintfoin was mixed with the common grasses which compose our meadows. The growth of the saintfoin and wild honey-suckle has been, beyond comparison, greater than that of the common grasses. It is to this cause I attribute the failure of success on grass ground chiefly filled with common grasses. I have a field of lucern separated from a natural meadow only by a brook. I have greatly increased the lucern by plaster, whilst the effect of a like quantity on the adjoining grass land, was scarcely, if at all, perceptible.

I ought to remark, that the effect of plaster, being to fit the plant for the absorption of moisture, its operation is always greatest on dry or calcareous soils. Upon clayey, or wet lands, it does not operate.

SECTION V.—OF THE PROPER SEASON TO SOW PLASTER.

The greatest quantity of plaster which I have sown, has been in the months of March and April. That which I have sown in December, has produced a great effect; and this year, after the first cutting of my lucern, in the middle of June, perceiving some parts of the field less vigorous, I conjectured it had been overlooked in spreading the plaster. I accordingly applied it, and in fifteen days I had the pleasure to perceive the difference between that part of my land and the rest disappear. I think, however, the winter season the most proper for the sowing of plaster; for if it is spread at a period too near the cutting of the crop, we carry off a part of the plaster with it, which injures the hay, and reduces the quantity of manure. Five hundred parts of boiling water are necessary for the complete solution of one part of plaster, and therefore the plaster should be spread a long time before the crop is cut, in order that it may be all dissolved and absorbed. By employing plaster in the winter season, the plants will start earlier in the spring and more vigorously, and will be thus better able to withstand late frosts. If they are touched with the frost, they are able sooner to recover.

SECTION VI.—OF THE SORT OF WEATHER MOST PROPER
IN WHICH TO SPREAD PLASTER.

Plaster ought to be scattered, or sown, in calm weather. In windy weather it is apt to be blown away; and, being spread in too small or unequal quantities, its effects are lost.

A slight mist or rain, by fixing it as it falls on the leaves and stalks of plants, is very favourable for spreading it. Thus, the misty weather of the spring and fall, is to be selected. You may, indeed, spread it in very cold dry weather, if it be calm.

SECTION VII.—OF THE QUANTITY OF PLASTER NECES-
SARY FOR A GIVEN EXTENT OF LAND.

“In too great quantities it makes the plant shoot too vigorously for its strength, and renders the fodder less nutritive for cattle. It is apt to be weak and lodge, and thus injures the crop by rotting it. In that case it ought to be speedily cut; but, even in that case, the hay is apt to be musty, and is made with great difficulty.

“Applied in too small quantities, its effects are scarcely perceptible, and are of short duration. After various experiments, I have determined that about a pound of well pulverized and burnt plaster, is sufficient for a square toise or, (or thirty-six square feet nearly.)” [This would be at the rate of 1200 *pounds to the acre, or, at least, eight or nine bushels.* I have, in all these calculations, only attempted to approximate to those of Monsieur Canolle, because it is not material. It is sufficient to shew, that the plaster, when it is used as a manure in Europe, is applied in quantities far exceeding what are generally used in this country. This may possibly explain the cause of failure in some instances here.

It is not necessary to add M. Canolle’s direction for sowing or spreading plaster. The art is well understood with us. It should be sown very much in the same man-

ner in which the small grains and grasses are sown, having reference to the greater quantity of plaster proposed to be distributed. A man used to sowing two bushels of rye to the acre, would soon learn to sow six bushels of plaster on the same quantity of land. As the operation takes but little time, the plaster would be more equally distributed, if it was sown at *twice*. As soon as the workman had finished sowing three bushels, he might go over it again in a different direction, and sow three more. We believe, that our farmers have, as yet, been too scanty and economical in the application of this manure.

It may be thought, that the expense would be too great. Six bushels of plaster would not cost more than four dollars ground, (except the transportation.) If its effects endure, as is pretended, four or five years, what manure can compare with it in cheapness?

It is not pretended, however, that plaster will produce good effects on all soils; and it is to be doubted, whether there is more than one third of the grass land in the state, to which it could be applied with success, perhaps not so much; but it is, certainly, deserving of fair and *patient* trial.

In corroboration of Monsieur Canolle's experience, as to the quantity of plaster necessary for an acre, we cite from the authority of the celebrated Kirwan, one of the best writers on manures, as quoted by the Massachusetts Agricultural Society, in a publication in 1799, that the quantity to be strewed on an acre, is about *eight bushels*.

The translator of this article, some time since, published an account of one of his own experiments on plaster, made purposely to ascertain, whether there was any foundation for the commonly received *notion* that plaster, or gypsum, would not answer near the sea-coast. He then sowed, or strewed, at the rate of twelve bushels to the acre, on a small spot, and the effect was very great and obvious. Since that time, he has continued for three seasons the use

of plaster on clover, and he can venture to affirm, that its effects are as great as those represented by Monsieur Canolle. He has invariably applied it to dry, gravelly land, which, before, he used plaster, hardly yielded grass enough to pay the expense of cutting, but which now furnishes the best crops, and retains its verdure better than any land he possesses, though he has some rich, low, and moist ground. We now introduce to our readers the experiments of one of our Trustees, who was among the earliest, most patient, and most observing persons in the trial of this manure, in this neighbourhood.

[To the Corresponding Secretary.]

The power of plaster in promoting vegetation, is certainly very extraordinary; but how this subtle principle operates, seems as yet to disappoint the most intelligent and inquisitive. Some who have made very extensive and successful experiments therewith, in the interior, cannot but believe, that its application is beneficial every where; whilst others, who have pursued a like course on moist soils, on hard bound grass fields, and in many situations on the sea-coast, under their impressions of discouragement, seem almost disposed to doubt its utility under any circumstances. I have been induced to think its operation was ineffectual near the sea-coast. Indeed my own experiments, distant about two miles from the bay, led me to this conclusion. But I found, in conversation with some very intelligent farmers upon Long Island sound, that they have experienced great advantages from its application. From this it certainly appears, that its operation depends more on the nature of the soil than from the state of the atmosphere, as constituted by its contiguity to the sea coast. It is to be hoped, that by a continued series of experiments, some light may be shed upon this subject, so

interesting to agriculturalists. It opens so extensive a view to the enrichment and productiveness of our soil, and promises to add so abundantly to the means of support, both for man and beast, that it presents as it were a new era in the annals of agriculture. Not confining itself to a single class of the community, but interesting to the political economist as the increased support, comfort, and happiness of the great family of man.¹

I shall now proceed to state the result of some experiments, made in several successive years, upon different soils, and in distinct places. The first was about fourteen miles from the sea-coast, upon a field of rye, where the soil was rather light, gravelly, and tolerably well manured the year previous, for a crop of corn. About two bushels to an acre, were spread on a part thereof. Though no measurement of the grain was made, yet the stalk was stronger, more green and flourishing, and the product of grain itself evidently more in quantity.

At the same time an experiment was made upon Indian corn, about one spoonful being thrown upon each hill at the time of weeding. Its beneficial effects were, in this instance, very apparent in the size of the plant, in the ear, and in the green colour thereof.

The advantage was apparent also in several vines and vegetables to which it was applied, and the like difference of colour and thrift of the vegetable was distinctly observable in all cases. The effect of its application, in the laying down of land to a grass crop, was the most remarkable during this year. The crop where it was applied at the rate before mentioned, of two bushels to the acre, was nearly double to that where none was applied, although the land was, under every other circumstance, equal in its advantages. In the application of the plaster to grass sward, which had been long laid down, no beneficial effect was observed. I then transferred my experiments to a situation, about two miles from the sea-coast, upon a moist, rich,

heavy, clayey soil; and they here were, for several years, continued in every mode of application, but I am constrained to say, I never could perceive any benefit in the application of plaster in this situation.

In the spring of 1816, I again commenced the use of plaster in the place first mentioned, and with the advantages formerly experienced. In the application of it to corn, the plant grew much larger, measuring six inches more in height than where none was used. The product of grain was also greater, although no comparative measurement was had. In the application of the plaster to potatoes, where it was used in addition to manure, it added about one tenth to the quantity of the crop. But where manure was used alone, and plaster alone, the increase of quantity by plaster over what was given by manure, was one bushel in sixteen. Here it is to be noted, that where manure was used, there were many small potatoes; but where the plaster alone, they were of more equal size.

It ought here to be recollected, that this was a dry season. In 1817, the experiment was again renewed with the like result upon the same vegetables, which led to a more increased cultivation of that useful vegetable, the potatoe. The past season also might be considered as in a considerable degree a dry one. Having thus submitted the result of the vegetation of several seasons, by the use of plaster, the subject might be dismissed with the hope of exciting the attention of other agriculturalists on the subject; but one or two references to experiments, which have been heretofore made, and to the observations made by Sir Humphrey Davy, in his lectures, which seem coincident, are naturally called forth. An ingenious experimentalist has, with much apparent accuracy, stated in a foreign publication, that by a frequent recurrence to a field of clover, which was laid down with plaster, the dew thereon was very observably retained more than half an hour after it had disappeared from vegetables where none had been

used. It is the observation also of the ingenious chemist above mentioned, that the application of plaster added much apparently to the woody fibre of plants. From all which may it not be deduced, that in perfect coincidence with the foregoing experiments, that one effect at least of the use of plaster is, an attraction of moisture, which induces the perfection of the woody fibre of plants? I have no doubt, that other coincident effects may arise from the use of this stimulating principle.

But as these can only be traced in a long and careful course of experiments and observations, I dismiss the subject with a sincere wish, that others better qualified may pursue it; and if any beneficial observations hereupon be excited from other correspondents, it will afford me much satisfaction.

I am, Sir, respectfully,

J. W.

SOME REMARKS UPON MERINO SHEEP, SHEWING THAT THEY OUGHT NOT TO BE ABANDONED IN DESPAIR, AND INCLUDING SOME JUDICIOUS OBSERVATIONS TRANSLATED FROM A FRENCH WORK ON THE SAME SUBJECT.

[By the Corresponding Secretary.]

IN the first place the writer would observe, that he knows it would be vain to attempt to bring merino sheep soon again into favour; all that he aims at is to prevent their entire destruction, or the utter neglect of them, which would eventually come to the same point.

He happens to be one of the very few men of property and leisure who escaped the merino contagion. At the very height of the disease he regretted, though he could not but smile at its violence. The issue was foreseen. Indeed it was impossible it could be otherwise, for if the merino had yielded what the Argonauts went in

search of, a golden fleece, it would have left many of the patients who laboured under that desperate disease exceedingly feeble, and purse-sick.—What animal of that size could possibly repay the prize of one thousand and even three thousand dollars given for a single male, and two hundred dollars for a female, charged moreover, often with extravagant prices paid for farms, the costs of management, and of mismanagement too?—The merino, like every other sheep, requires some skill, some previous acquaintance with its nature and proper treatment, for which neither the countinghouse nor the workshop are the proper places of education. There is a question which applies to all other sheep as well as the merino, and that is whether we can ever afford in New England to keep such extensive flocks as are kept in England, and some parts of France and Germany? It seems to be the better opinion that we cannot, and that sheep will probably continue to be raised but in small proportions to other stock, or in about the proportions in which they have been hitherto raised. Let this question be settled as it may, it appears to us certain, that the merino sheep is a much more profitable animal than our common coarse woolled sheep, not that it would altogether supply the place of our old flocks, for we take it to be as true here as it is in England, that for many uses the coarse wool is absolutely necessary.

Many questions which were once problematical are now settled in favour of the merino.—It was doubted whether it would stand our climate—It does perfectly—Whether its wool would not degenerate—It rather improves—Whether its meat would be good for the table? It is as fine at least as any mutton we have.

Whether the wool could be exported to England and sell there at a fair price? It has been done, and met such a sale as would yield a much greater profit on merino sheep than on the common sheep.

When therefore we add to this, the great success which the Saxons, whose climate is as severe as ours, have experienced in raising the merino sheep, that the Saxon merino wool is the best in the world, and fetches the highest price, nearly double that of some ordinary merino wool, and treble that of common wool, we do entertain hopes that a disposition to depress them and run them down will no longer be felt, but that they will be suffered gradually to rise to their proper value. With these remarks by way of apology for introducing an unpopular subject, we proceed to the extracts from an essay by M. Morel de Vindé, published in Tessier's *Annales d'Agriculture*, so late as 1816.

M. Morel, an extensive proprietor it should seem, a man of great intelligence, as our readers will perceive, the owner of an estate at Vindé near Sezanne, in the department of the Marne, within fifty or sixty miles of Paris, thus gives an account of his own experience in merino sheep. His remarks go to a much higher point, to prove not only that merinoes are profitable in themselves, but tend to promote good culture.

“The amelioration and improvement of agriculture, appearing to me to be one of the immediate and necessary effects of the improvement in the breed of sheep, as I shall prove in the following article, and *that* part of this department, of which Sezanne is the centre, being one of the most backward in every thing that may be called good cultivation, I conceived the idea of introducing merinoes into this country, with all the advantages which usually accompany them. I had many obstacles to encounter, which need not be detailed to any who know how difficult it is to eradicate the prejudices of farmers. [*French* farmers are here spoken of; it is hoped and believed that the difficulty is not so great with us.] I had *in vain* solicited my own tenants, and the owners of the flocks held in common, to accept gratuitously, (for nothing) pure rams to mend their breed. They repelled the offer with disdain, and even with dis-

trust. They replied, that this race (the merino) could not live in their country, that they could not *sell the wool*, that they would cost too much to keep, &c. &c. In short, I became satisfied that I must begin by *convincing* them by *selling*, not *giving*, and I proceeded thus:

“ I bought of my respectable colleague, M. Tepier, one hundred males of *pure race*. [So he always calls the unmixed merino.] I designed them to make the foundation of my flock at Vindé, and I intended to add to them all the rams I could spare for *Celle-saint-cloud* (one of Mr. Morel's other estates.) I then applied to one of my farmers who had more confidence in me than the others. I did not convert, but I made him yield to my entreaties, and to the pecuniary temptations I offered him.

In September, 1810, I sent him ninety-eight ewes, and fifteen rams of pure race. Every thing is so low in this unhappy country (certainly not above sixty miles from Paris) that he made a good bargain for himself in taking my sheep at six francs (one dollar and twenty cents,) a head per annum. I gave him besides, a franc (twenty cents) as a premium for every pound of wool they should give above six pounds each on an average.* All the produce was mine except the manure and premium.

The arrival of this flock was a great event in this country, and neither my shepherd, my steward, my farmer nor myself, escaped taunts and jests. However my flock went through the year without the loss of a single one. This was the first source of astonishment to my neighbours.

In June, 1811, (the next year) I had them shorn and weighed publickly. There was no want of curiosity, and the visitors were much struck with the weight of my fleeces, which was nine pounds a head. I employed some of my friends to come and buy this wool. I sold this year at forty cents the pound, and this high price touched and affect-

* The flock must have been very fine or there could not be much gained by the farmer as a premium. EDITOR.

ed my numerous visitors. [You see the French farmers consider forty cents a satisfactory price for merino wool. Why should we not be able to raise it as low? Is it our long winters, or inferior culture?] In short I gave out, that offended with the rejection of my former offer, I had forbidden my farmer to sell, give, or lend a single animal.

This prohibition excited their desire, but I secretly ordered the farmer to let out his fifteen rams at the highest price he could obtain, which he might put in his own pocket. Thus adding interest to secure his active co-operation. He used his permission well, and the fifteen rams were soon not sufficient to satisfy all the demands, and he let them at the average price of six dollars each. In consequence, I sent him forty-two more rams in September, and thus continued to increase them every year till they amounted to three hundred and fifty. The benefits were very great for the farmer, but still greater for me; for if in the neighbourhood of Paris, and in countries where forage is dear, the value of the wool is not sufficient to pay the expense incurred by a flock without selling the increase, it is not so in places where forage is cheap: My sheep at Vindé bringing me an average of eight pounds of wool each, which sells at forty sous, or about forty cents the pound, that is about three dollars and twenty cents a head, and only costing me about one dollar and twenty cents for keeping, each male thus produced me an annual profit of two dollars.

Soon the flocks of that part of the country changed entirely, the mixed breed increased every where, and you now see in the flocks of individuals, as well as in the common ones, crosses of the third generation.

But this was not the only object I had in view. I knew that this improvement of the breed would *necessarily* force them to better agriculture.

My farmer perceived *the first*, that he should derive a benefit by employing his fallow grounds in raising fodder for animals that were so productive to him. He asked my

advice. He raised vetches to cut in flower. He sowed clover, tried saintfoin, he succeeded, was soon followed by others, and the aspect of this country rapidly altered. Farmers once enlightened, no longer repel good advice and example, and I have the inexpressible satisfaction to see now on their lands, so ill managed ten years ago, artificial meadows in full prosperity, plaster employed at great cost on the clover lands, and some parts of the waste lands overloaded with plants for forage.

And what produced all these benefits? Simply the introduction of fine woolled sheep, and creating the desire of possessing them. I shall developpe this idea in the next chapter.

OF THE NECESSARY EFFECTS OF THE IMPROVEMENT OF
THE BREED OF SHEEP ON AGRICULTURE.

People are surprised at the obstinacy of farmers in their ancient habits, and prejudices, but it appears to me quite natural. In the ordinary state of things, when nothing new stimulates the farmer, what motive has he to change his routine or system? No immediate interest excites and draws him, but the dangers of innovation deter him from it. But if he perceives a new considerable and certain profit, rely upon it he will adopt the novel usage which is necessary to attain it. And such is the effect of introducing merinoes or even half bloods in any country or district. Till this happened the farmers only calculated on the *death* of their sheep. It was their *death only* which turned to their profit, of course they took but little pains to make them live.

But here is a breed newly introduced, whose fleeces are more than six times as valuable as those of others, a breed which do not yield a profit except by their good health and preservation, and give a much greater profit by their lives than others by their deaths. It is necessary then to make every exertion to subsist, as well as possible, this new breed.

But these means of subsistence are ruinous as we are obliged to buy them. We must then try to raise them ourselves. Once admit this inference, and we are instantly obliged to commence *artificial meadows*, (all grass sown for mowing land is here intended.) We yield to the temptation more readily, because obtaining an extra quantity of manure by a well fed and permanent flock, one would have reason to dread the exhaustion of the land; and one would try to prevent this effect by a change and routine of crops; and as this series of crops and effects really includes the best principles of agriculture, it will of course follow that the farmer will really have been forced to adopt it without design. He will grow more industrious; better informed, more disposed to imitate, and in spite of his prejudices, the introduction of fine woolled sheep will make him a good farmer. If he refuses to adopt this improved agriculture, he must give up his sheep, and that he will never do when he has once felt the superiority in weight and price of these improved animals. I am, therefore, bold to assert, that the late improvements in our agriculture, are owing in a great measure to the introduction of fine woolled sheep into France. That if they should now be abandoned, agriculture would again become retrograde, and as much so as it has of late improved, and of course that it is for the interest both of the government and people, to encourage as much as possible the improvement of the breed of sheep."

In letters addressed to the French minister of the interior, M. Morel de Vindé, (who it would seem was not an emigrant, for he carried on his great experiments during Bonaparte's reign, from 1808 to 1815,) gives credit to Louis XVI, for introducing, and causing to be propagated, the merino sheep in France; and says if his views had been followed up, France would now have had fine wool enough for her own consumption. He says that the faults committed in the management of them during the revolution, and especially since 1806, (under Bonaparte) had

caused the amelioration to stop, and had well nigh produced a total loss of the improved breed. He then adds, that the government may judge of what importance this article is to France, since she purchases from foreign countries twenty thousand bales of fine wool annually, for which she pays the sum of from thirty to thirty-five millions (francs) equal to about seven millions of dollars, which he says in a very few years she might produce herself. He proceeds to detail the political and commercial advantages which would result to France from encouraging the production of this article of primary importance. We do not copy this part of his essay, because it must be familiar to every farmer, that the first duty of a government, and the highest interest of a nation, coincide in encouraging the production at home of these raw materials which are of the first necessity in manufactures, the most important, and of most extensive use. We shall conclude this extract by giving M. Morel Vindé's own success or ill success (whichever we may call it) in raising merino sheep. In some views he was unlucky, because his loss by diseases far exceeded what well managed flocks *here* have suffered, and his prices of sale for wool were low. But his sheep he sold well.

"I have thought," he remarks, "that after eleven years experience, I should render a service to those who would raise merino sheep, by communicating to them the produce of my flock and the losses I have experienced. It may serve at least as a means of comparison with the efforts of others. I began my establishment in June, 1805, with two rams and ninety-two ewes. In eleven lambings I had born 1087 males; 1101 females; total, 2188—Out of which there have gone from my flock—by decease, 145 males, 209 females; total, 354—By sale, 534—By sending to my other farm at Vindé, 350—Total of those gone out, 1238. Remains of my flock, 950, to wit, 300 males, 650 females.

Thus, (besides what he sent to his other farm at Vindé) he says, "I possess a flock of 950 sheep, all young, all well

chosen, and the most perfect possible. I have sold 534, (the ewes chiefly mixed breed) for the price of 51,637 francs, or about 10,000 dollars, say 20 dollars each. This price is low, but the circumstances of the few last years have been so unfavourable that I have never sold but after selecting the best for my own flock. I have shorn 4279 fleeces. These weighed 33,381 pounds, and were sold for 68,326 francs, or about 13,600 dollars, and what is more, I have been obliged to make my lands produce more forage, in order to nourish this great number of sheep, without spending money to purchase food. Besides the advantages I have gained in times so bad, I have obtained a more important result by introducing with great and rapid success, the improvement of flocks and of agriculture in one of the parts of France the most backward in these respects."

Such are Mons. Morel's remarks, which we must all acknowledge are intelligent and sprightly, and from the very respectable source from which we extract them, we have as much reason to conclude that he is as worthy of credit as Arthur Young, or Anderson, or any other writer.

It will be seen that in eleven years his flock of 100 sheep produced him

In wool,	13,600
In sales of increase,	10,300
Suppose his sheep he kept at Vindé to be equal in value to what he did sell, i. e. only 20 dollars each	7,000
His own flock at St. Cloud, 950, at same price,	19,000
	<hr/>
	\$ 49,900

If his wool had sold at the average price (in <i>this</i> country) of the last two years of peace, say one dollar, it would have amounted to	20,400
	<hr/>
	\$ 70,300

One cannot perceive any error in this calculation, and yet it may exist.

[Extract from Tessier.]

A FRENCH writer, whose essay is contained in the same volume of Mons. Tessier's annals, with the one from which we have extracted the remarks on the merino, has some curious and to us new observations, as to the treatment of canker in apple trees, and gum in peach trees.

He says he had heard "that a cultivator, in order to prevent the *canker* in apple trees when he grafted them, inserted and *closed up* in the slit or cleft made in grafting, a *small blade of iron*. I have repeated this experiment four years ago, and it has succeeded hitherto," but "I have a remedy which I have never known to fail both for gum and canker. It is easy to see when the tree is threatened with the malady, the bark becomes slippery, smooth, and tender. The tree begins to flatten on the side next to the sun, or perhaps the opposite side. You must then hasten to make *setons*, or *issues*, by cutting slits in the bark. Place them as you would issues in the body, in a proper relative situation to the malady, say on the opposite side, but if that does not succeed, proceed with your incisions. You may continue them without danger, quite to the root of the tree. It ought to be done three times a year, in April, July and August. For the canker, you must, besides, cut off the diseased bark, and cover the wound with cow dung plaster." He seems to think the canker is owing to the superabundance of sap flowing around the graft, which by the incisions finds an innocent and safe vent.—We do not vouch for its efficacy, but it is easily tried, and can do no harm we are persuaded.

ON THE INJURIOUS INFLUENCE OF THE BARBERRY BUSH UPON WHEAT AND THE OTHER ENGLISH GRAINS.

THIS opinion, often deemed a prejudice, and by others considered as an unquestionable fact, has lately received

the most full and scientific investigation in France. The result of these inquiries, comprised in no less than eighty-four pages of Tessier's annals of agriculture, published so late as 1816, seems to settle the question as to the injurious effect of this plant, and that it is pretty uniformly in France, England, Switzerland and Germany, considered, and we may almost say proved, to be one of the causes of blight. We ourselves were perfectly incredulous on this subject, but we are compelled to yield to the weight of proofs.

It is no longer attributed to the influence or operation of the farina of the flower of the barberry, which is over and disseminated several weeks before the several species of grain are in blossom, but it seems to be attributed to a parasitic plant very abundant on the barberry, and which is considered to be the same which causes the rust upon the stalk of the wheat. It would be beyond the scope of this Journal to give all the evidence on this subject, but we refer our readers to the work above mentioned. We can assure them, that though wholly incredulous, we have been perfectly satisfied with the evidence, patiently, coolly, and fairly sought, and furnished in that work. France, being of all nations, perhaps the most interested in this inquiry, much respect is due to the deliberate opinions thus formed after candid research.

ON THE BRIGHTON CATTLE SHOW.

[By the Corresponding Secretary.]

THIS Institution owes its origin to the successful example set by the most distinguished cultivators in Great Britain. It is a fact well known, that the effect of these public exhibitions of domestic animals in Europe has been to enhance the value of the best animals, and thus to give to those who select and raise them, the reward which is naturally due to them. If this had been the only consequence,

it would have been sufficient to induce an imitation of the example. But much more important effects necessarily follow. Others, who have not been so successful or attentive, are induced to emulate, and to attempt to excel the successful candidates, and thus the whole breed of any particular species is rapidly improved.

A country might possess in some particular county or district, a race of animals far superior in every respect to the ordinary ones of the same species, for a great length of time, without its being known, or any attempt to propagate and increase the breed. Thus, though the Byfield, and Bedford race of hogs has been long in the country, yet their extension and propagation would be much more gradual, if only communicated from neighbour to neighbour, than when they are made the subjects of public exhibition. The same remark applies as forcibly to individual and rare examples of singularly good properties in cows or bulls, which might remain confined to their owners for many years, their calves committed to the butcher precisely because they were fatter than any others, and thus the increase of the race be prevented. By tempting the owners of these extraordinary animals to present them for premiums, their merits are made known, they are either purchased at great prices, or the owners are induced to preserve their progeny, and thus a rapid improvement is effected in our domestic animals.

Some remarks have been occasionally made, indicating dissatisfaction, and expressing a sort of sneer at the offer of premiums for imported animals. This subject is not properly understood.

The trustees have no doubt that there exist scattered over our country, animals of every sort adapted for domestic uses, equal to almost any which can be found in any other country; though it would be extraordinary if nations which have for fifty or a hundred years, at great expense, been constantly selecting their best animals for *breeding*, should not have *accidentally* obtained a breed

better than could be found in a country where there has been no system, no effort, no public encouragement, but where they have been subjected to indiscriminate slaughter.

When individual bulls of a particular breed are sold at 300 or 500 guineas, (1500 to 2500 dollars,) and this too in a country where an ordinary bull is as cheap as in ours, it would be indeed surprising if this encouragement should not have produced animals superior to any which would be obtained without such rewards. We could only account for its failing to do so by supposing such a nation in a state of delusion, and that they threw away their money without any consideration. Some misapprehension has also existed as to the principles on which the trustees have awarded their premiums. It has been supposed that in offering as well as awarding their premiums, they had reference *only to size*. It is not extraordinary that such an inference should have been drawn from the terms in which the premium was offered—but no such idea was at any time entertained by the trustees. They feel and recognize that Bakewell's principle, that those are the most profitable animals which give the greatest quantity of flesh with the least bone and offal, is incontrovertible. The first premiums they offered were founded on this sentiment, and of course they required a minimum of size of 1300 pounds only, believing this was one which a well formed and profitable animal could easily reach, and yet be perfectly within Mr. Bakewell's rule. They accordingly gave the premium the first year to two oxen weighing rather less than 1300 pounds.

But the spectators were dissatisfied. They went away disappointed, and said that hundreds of as fine oxen might be found in the State, and therefore it was absurd and of no use to give them a premium. Now though it is freely admitted that it is the duty of such a society to endeavour to correct erroneous opinions, and to introduce those which are more sound, yet in the outset of such an institution, when it was necessary to force it into public favour, and

attract public attention, it was thought advisable to allure to the show the owners of extraordinary animals, which had cost the raisers of them much pains, and which would better satisfy public expectation, however erroneous the opinion of the value of such cattle might be. Yet in awarding this premium on the great Springfield oxen, the trustees did not depart from the spirit of Bakewell's principle, as they awarded the first premium to the smaller ox of the two, on the ground that he had the most flesh to the same weight of bone. The trustees wish therefore that it should be distinctly understood, that in judging of animals which are offered as fat ones, they have, and shall always prefer those which with the least quantity of food, and the smallest weight of offal, shall offer the greatest quantity of meat.

This will apply to oxen, sheep and swine. But there must be some exceptions in favour of those persons who with uncommon care shall have brought up animals of very extraordinary size, without very heavy expense, since they believe in the outset of their experiment, such an attention on their part will have a beneficial effect on the general care and attention to the race of animals, always however, avowing their preference for those which show a remarkable tendency to fatten, whatever may be their size.

OF THE DIFFERENT USES TO WHICH THE WOODS OF
THE AMERICAN FORESTS ARE APPLIED IN THE VA-
RIOUS PARTS OF THE UNITED STATES. FROM THE
FRENCH OF MONS. MICHAUX.

[By the Corresponding Secretary.]

IT may appear a little singular, and wound the pride of some of our citizens, who cultivate too strong a prejudice in favour of our own country, that we should resort to a foreigner to afford us intelligence as to the value and uses of our own woods.

Yet it is nevertheless true, that there probably does not exist a man in the United States, who could furnish such a complete body of information on this subject as M. Michaux. Nor is it any reproach to us, for what man among us has been employed systematically for four or five years in traversing the United States, as Mons. Michaux did, with the exclusive view of ascertaining the number, character, and uses of our forest trees?

It may also be questioned whether this information is important, and whether it merits a place in an Agricultural Journal? We have always wished that our publication should be as well devoted to more extended views of the agricultural interests of the nation, as to those more immediately practical.

There is no publication in our country in which this sort of information can find so natural and proper a place. In botanical works, room cannot be found for so many practical remarks, and there is not enough of science in this subject, to entitle it to a place in our philosophical publications.

But what is its use? Surely it is of some advantage, to know the various employments, and the degree of value of all the trees in the United States. It is to be hoped that sooner or later we shall become a planting nation; that we shall attempt to repair the waste and destruction which a thoughtless profusion and carelessness have occasioned in our original forests. It may then be important to know whether some of the trees of the Middle and even Southern States may not be introduced into New England, and whether we cannot in exchange furnish them with some of ours.

For example, the Tulip tree, (*Liriodendron Tulipifera*) is not found growing wild north of Connecticut, and yet it flourishes well with us, and it will be seen that it is successfully applied to some uses for which our own trees could not be used to equal advantage. With this brief apology for occupying so much of our Journal on the sub-

ject of our forest trees, we shall proceed with M. Michaux ; remarking that the part of the information which applies to our own Massachusetts' trees may be thought too familiar, but may be useful and agreeable in other parts of the Union.

Mons. Michaux remarks, that his object is simply to point out the trees which are employed in the mechanic arts in the United States, and he expresses himself with great modesty as to the accuracy of his information. He begins with naval architecture.

In Nova Scotia, New Brunswick and Maine.

The shipwrights employ for the keel, in preference, the sugar maple or white elm. For the bottom of the ship, they have no, or very little, white oak. The small quantity they possess of the gray oak, (*quercus ambigua*) and of the red oak, (*quercus rubra*) induces them to reserve them for the upper works. They supply the want of oak for the parts which are under water, by woods, which, though far inferior to oak, yet answer better for this part of the ship than they would do in those exposed to alternate dryness and wetness. Thus, for the bottom they employ the yellow birch, (*betula lutea*) the red beech, (*fagus rubra*) the sugar maple, and the white ash, (*fraxinus Americana*) the two first are most esteemed ; the last the least. For the the upper works they employ the white oak, when to be procured ; and for want of it the gray and red oak. The planks are of white oak. For the wales the red or Norway pine, or sometimes the Southern or long leaved pine. For knees, white oak, gray oak, red oak, or black spruce, (*abies nigra*) frequently employed because easily procured. The decks are of white pine, or red or Norway pine. The lower masts are of white pine, and the upper of black spruce.

In Boston.

They use for the keel pretty constantly the white oak. For the bottom and upper works, pretty universally, white

oak, but sometimes employ for the former the red oak, gray oak, and scarlet oak, all under the general name of red oak. For the knees they also use the white oak, but in the repair of old vessels, they employ sometimes the black spruce. For planks they use white oak, and for wales the southern pine. The decks are generally of white pine, but they prefer the Norway pine. They procure it from the Middlesex canal. The builders call it yellow pine, but that pine does not grow so far to the north. Some very few vessels are built of live oak and cedar.

In New York.

For the keel they always use the white oak. Formerly they sometimes employed the hickory, (*juglans squamosa*). For the bottom they use the white oak, and occasionally the rocky oak, (*quercus prinus monticola*). For the upper works, live oak and cedar, placed alternately. They are imported from Georgia and East Florida. For plank on the sides, they use white oak, and sometimes the rocky oak; and the same for knees. For the decks they use the yellow pine, (not the Norway) which they import from the eastern shore of Maryland. The masts are of white pine, the upper ones of black spruce.

In Philadelphia.

For the keel they use white oak, and rarely, walnut or hickory. The bottom is built of white oak, mixed with a small proportion of black walnut, of locust, and of red mulberry. For the upper works in well built vessels, they employ the live oak and cedar. They import also the red bay, (*laurus caroliniensis*) which is employed in small proportions, instead of cedar, which is becoming scarce. They also use in the upper works the locust, red mulberry, and black walnut. These woods are stronger than the red cedar, and lighter than live oak, and if clear of sap and well seasoned, will last almost as long as live oak, and

longer than the white oak. They come from the river Susquehanna. Large red mulberry trees also grow on the borders of the Delaware. In well built vessels they no longer employ white oak for the upper works. The plank are always of white oak. Treenails of locust, knees generally of white oak, and as they become scarce, of the rocky oak, there called the chesnut oak. The black walnut is also esteemed for knees, but proper pieces are difficult to be procured. The decks are of yellow pine, or long leaved pine, imported from Carolina or Georgia. The large masts of white pine; the upper ones of yellow pine or black spruce.

In Baltimore and Alexandria.

They use chiefly the same woods as in Philadelphia. Their ships are very well built, but they make more use of the locust and red cedar.

Charleston, (S. C.) and Savannah.

The keel is always made of the *pinus australis*, or long leaved pine, and is as good as white oak. The bottom is made of live oak and long leaved pine, and sometimes they mix with them the post oak, (*quercus obtusiloba*) and (*quercus falcata*), Spanish oak. The upper works of live oak and cedar. The decks are always of the long leaved pine, which is the *best pine* that grows in North America. The knees are of live oak generally. The plank on the sides, of the long leaved pine, but they say they do not make as good joints as those of oak. Treenails of locust, or heart of pine. The masts are of the long leaved pine, which are stronger than white pine. Ships built of these materials, well seasoned, are as strong as those of New York and Philadelphia.

Louisville on the Ohio.

For the keel they use the white oak. For upper works, the white oak mixed with the black walnut. In the bot-

tom they employ white oak, with a great proportion of locust, red mulberry and black walnut. They employ also the wild cherry, and red elm, but they ought not to be used but when they are well seasoned. The knees they make of locust, red mulberry, black walnut, and white oak. The planks are always of white oak. The decks of yellow pine, (not the Norway). The treenails of locust. Masts of white pine, and the yards of black spruce, which they procure from the Alleghany river. Ships' pumps are made in New York, Philadelphia, and Baltimore, of the (*pinus rigida*,) sap pine. In the maritime Southern States, of the *pinus toeda*, or loblolly pine. Blocks and oars in the Northern States, are made of white ash. In New York and Philadelphia, partly of the white ash, and partly of the red ash. Most persons know that blocks made of the red elm would be preferable, but it does not grow in sufficient quantities to the east of the Alleghany mountains, to be employed for this purpose. Figures and ships' heads are always made of white pine, as being more easily wrought.

FOR BUILDINGS.

In the great cities they are generally of brick, but in the villages and country, nineteen twentieths are built of wood.

In New Hampshire, Connecticut, Massachusetts and Vermont.

In the great towns the white pine is preferred, but as it grows scarce by consumption at home, and exportation, they use for some parts the black spruce and the hemlock. The large timbers of the frame are universally of white pine, but the joist are frequently of spruce. The first boarding is of hemlock spruce. [A mistake.] The second is composed of what they call *clapboards*, or as M. Michaux spells it, *calp boards*. The planks and floors are generally of white pine, but in the country some prefer the black spruce, because it is harder, and less liable to be in-

jured by the furniture and wear. The shingles are made of white pine. Those made of the (*thuya occidentalis*,) white cedar, would be preferable, but could not be afforded as cheap. Laths are always made of hemlock. Doors and window frames are always of white pine.

In New York.

In wooden houses, the frames are altogether of white pine: as are also the boards of the outside and inside. The floors are of white pine, when they are intended for carpets, and in others of the yellow pine, because they are harder. Roofs of shingles of white cedar. In brick houses the timber is often of white oak, but all the inside work of white pine.

In Pennsylvania and Delaware.

The white pine is employed in the wooden houses. And the shingles are of white cedar, or yellow pine. In brick houses, the lower timbers are of white oak, or black oak; and the upper ones of sweet gum, (*liquidambar styraciflua*). For joist they use the white oak, black oak, and tulip tree, preferable for its lightness as well as solidity. Floors generally of yellow pine. Roofs of white cedar or cypress. Windows and doors of white pine. The window stools of yellow pine. The cornices and inside work of white pine.

In some of the back parts of Pennsylvania, the frames of houses are of white oak. The floors of very narrow strips of white oak, and the shingles of black oak. The outside boards, doors, window frames of the tulip tree.

In Pittsburgh, and at Wheeling on the Ohio, the frames of houses are of white oak. The outside boards and inside work of white pine, and the roof and covering of white pine.

Many houses in this part of Pennsylvania are built entirely of white oak, and shingled with black oak.

The tulip tree is admitted to be inferior to the pine, but more durable than the oak, and more easily wrought.

Chesnut shingles would be preferable, but are not easily obtained in this part of the country.

In Maryland and Virginia.

The houses of wood are generally built of yellow pine; except the inside work, which is of white pine. The shingles are of the (*cupressus thuyoides*,) here called the juniper, except some that are made of the (*cupressus disticha*,) cypress.

N. and S. Carolina and Georgia. In the lower parts.

Three quarters of the houses of Charleston, Wilmington and Savannah are built of wood. The frames are of the long leaved pine, (*australis*). The boards outside are of white pine. Inside of white pine and cypress; so also for the doors, windows, &c. Cypress is used also for shingles. Formerly they made more use of cypress than at present; and in the interior they use the cypress chiefly, which is more durable than the long leaved pine.

In the Upper Carolinas they build of the yellow pine, covered with shingles of the same, or of the tulip tree.

In Kentucky.

At Lexington and its vicinity, where the greater part of the houses are of wood, the frame is of blue ash, (*fraxinus quadrangulata*) or white oak, lower floors of blue ash, or white oak, and upper of the tulip tree. Outside boards, of blue ash and tulip tree; but these last are apt to shrink and swell. Inside work of the tulip tree, wild cherry and black walnut. On the roofs they lay boards of the (*celtis cras-sifolia*,) upon which they place shingles of the tulip tree. To prevent these last from shrinking they make them very short, and they last, it is said, forty years; and they have the advantage of never splitting, either by frost or heat.

M. Michaux was not in Lower Louisiana, but he learned that their wooden houses were constructed of the cypress,

(*cupressus disticha*) an excellent wood, very durable, and superior to all the species of pine.

Lest we should fatigue the patience of our readers, or be thought to devote too much of our Journal to a subject which though interesting to agriculture, is not so proximately connected with practical husbandry, we shall defer the rest of this essay of M. Michaux till another opportunity.

EXTRACTS FROM THE MUSEUM RUSTICUM, AN ENGLISH WORK; NOT AMONG THE MOST MODERN, BUT CONTAINING MUCH VALUABLE MATTER.

THESE are but few remarks applicable to English husbandry, that will not apply here. When they are not applicable, the good sense of readers will distinguish them.

“The bad success of great numbers,” says a writer in the above named work, “is owing to their not having a sufficient sum of money to begin with, which involves them in difficulties, and reduces their profit on every article of produce. The farm is *understocked*, (and he might add if he lived in Massachusetts, often stocked with poor animals) for want of money to buy better. They sell at a constant disadvantage, and in a few years, unless some lucky hit sets them up, they grow poor, in spite of industry, judgment, and application.

“The want of judgment too in apportioning and proportioning the quantity of stock, and of each kind, to the quantity and quality of the farm, is attended with great loss.

“There are inconveniences and losses, arising either from overstocking or understocking a farm; and the farmer ought always to remember, that *three beasts* of any kind, well fed, pay better than four without their bellies full.

“Two thirds of the land of a farm in a rich country should be grass, and a little one should *all be so*. The

vast expenses of the plough, without doubt, make many farmers poor, who, if their farms were grass would not run half the hazard, and enjoy a much better income.”

Most of the above remarks apply well to our country. Speaking of *gentlemen farmers*, a description of persons very numerous in England, and growing more so here, the author says,

“There are many evident reasons why farming should prove unprofitable to gentlemen who undertake to cultivate their own farms, whether for amusement or convenience, or generally speaking, *even for profit.*”

“In great farms in Norfolk, and where gentlemen will be at the expense of manuring with marle, there is no fear but they will have a profit; but in common farms, in rich countries, no profit can arise to any gentleman that does not give the business constant attention, and *descend to minutiae.* I am persuaded they lose considerably by keeping land in their hands. The plea of growing wheat, oats, &c. enough for *family use*, is a mistaken one; they had better by far buy every article, than have any thing to do with the plough. When I hear that farming answers to gentlemen who do not give the *farmer's attention* to the business, I *never believed it*, or at least am persuaded, regular accounts are not kept.” He then goes on to assign *some of the reasons* why gentlemen farmers do not succeed in making it profitable. Among the rest, “Cattle cannot thrive but under the master's eye—every variation of the season is to be watched—the lucky instant to be seized for ploughing, harrowing, sowing, reaping, &c. Constant attention is required,” which he supposes no gentleman farmer can or will do; and if he employs others, they run away with more than all the profit.

These remarks are most of them applicable in our country, though our gentlemen farmers have much more industry; there are many of them who give great and assiduous personal attention; yet the hired people too frequently get

the honey, and leave the expressed comb only to their employers.—But this English writer does not think that *gentlemen farmers* are without *their use*. He says,

“The public good *calls loudly* to all gentlemen to keep some land in their own hands, that experiments may be made, and modes of agriculture pursued, different from the practice of their neighbourhood, for the farmers at least, to see that their own customs are not the only good ones, and that there are improvements to be made even on *their* practices. All the inventions and new improvements in agriculture, come from gentlemen farmers. [He is speaking of England.] I do not wonder at this—it is natural enough, and is a sufficient reason why gentlemen should carry on farms, even if it is not profitable. The extensive use of manures, and introducing a garden culture into field husbandry, were the effects among an hundred others of gentlemen’s farming. But if public good had nothing to do with it, still the amusement would be a sufficient apology for it. Such farmers soon make a garden of their estates, and improve the value of them.”

The above remarks are in some degree applicable to our country, and in some respects more forcibly. Our gentlemen farmers have been usually *men of business*, not born to fortune as the gentlemen in England. They have wrought their own way to estates; are accustomed to attention; and to the direction of labourers. They know the value of money, and its most judicious application.

The equality of condition with us, renders the example of gentlemen farmers more useful. The small farmer and the pleasure farmer meet on equal terms, and frequently, and of course there is more interchange of thought and practices, more consultation and discussion than there can be in England, where it is admitted by the above cited author to be so useful. We will take horticulture as an example; the most delightful, and near great towns and villages not the least profitable branch of agriculture.

How long would it have been, before the common farmer would have introduced the fine pears which the intelligent and opulent Hugorots, the French refugees, introduced here? How long before our common farmers would have opened to themselves the rich treasures of the New York and New Jersey nurseries? There are very many species of fruits, including all sorts, which have been introduced by the zeal, intelligence and liberality of gentlemen farmers. The same applies to many culinary vegetables, and in some degree even to the more important plants destined for general subsistence. These reflections were excited by the extracts from the *Museum Rusticum*; and are designed to show that the richer cultivators who pursue agriculture for amusement are not to be considered as useless. They may be *drones*, but it should be remembered, that the swarms cannot be perpetuated, without that part of the common family.

The following prices of labour and farming implements in England, at the time when the *Museum Rusticum* was written, may serve to amuse.

A waggon complete, seventy-five dollars.

A cart complete, forty dollars.

A two wheeled plough, thirteen dollars.

A swing plough, four dollars and fifty cents.

First ploughing, an acre, one dollar and fifty cents.

Second do. one dollar and ten cents.

Harrowing an acre, twelve cents.

Price of horses from twenty-two to seventy dollars

Farm horses are meant.

Price of cows, from thirteen dollars to thirty-five.

Sheep, from two dollars and fifty cents to four dols. fifty.

Hogs, from one dollar and ten cents to nine dollars.

Wheat, from one dollar and thirty-three cents, to one dollar and sixty cents a bushel.

Barley, sixty-six cents a bushel.

Oats, forty-four cents a bushel.

Red clover seed, eight cents a pound.

Wheat straw, two dollars and thirty-three cents a load.

Clover hay, fifty-five cents a hundred.

Lime, eleven cents a bushel, or eighty-eight cents a hogshead.

Bricks, four dollars a thousand.

A carpenter, thirty-six cents a day.

A bricklayer, forty-two cents a day.

Making, plashing and laying live hedges for fences, ten cents a rod.—No fence could be reasonably expected to be made cheaper, and it may partly account for the great prevalence of this species of fence in that country ; or at least it shows to what perfection the art of making them had attained.

Brighton, July 24, 1818.

[To the Corresponding Secretary of the Massachusetts Agricultural Society.]

DEAR SIR,

YOU have for several years past considered the cultivation of wheat so important to New England, and particularly to this section of the country, and have urged so strongly trying the experiment, that I think the enclosed memorandum must afford you much pleasure ; it is from Col. Newhall of Newtown, a parish in Newbury, county of Essex, and gives the number of acres sown by his neighbours with wheat, the quantity of seed sown, and the produce of each lot for 1817. They have been in the practice of raising that grain for fifteen or twenty years past, and generally with success. I was induced to make the inquiry from seeing their grain, as I passed through the parish, and when most of it was fit to reap, appear much better than any I had seen in this neighbourhood ; the straw was bright, the heads long and heavy ; and in two or three instances the grain was reaped, and the kernels appeared better than any

raised in this town in 1815, which was considered a favourable season, and the grain fuller and heavier than it has been since. I observed that they have two kinds of Spring wheat, the white and the red; the white is considered the best grain, a larger kernel, and yielding a larger crop. The red is earlier, and less affected by blasts; you see a marked difference in the grain as you ride by it, and if I recollect, more of the patches near the road as I passed were of the red than the white. They all agreed as to the importance of sowing early; their soil is excellent, and their farms generally in fine swells, which perhaps gives them an opportunity of sowing earlier than those who have level or low ground. I have had a few bushels of my wheat of this season threshed out, and some of it ground this day; the flower is white and sweet, the kernel but little shrivelled; it was sown in March, and two parcels sown in April, as early as I could get it in the ground, is much inferior to it, many of the kernels shrunk, and the straw rusty; I impute it to late sowing; and had it been as early as that which I reaped the first of this week, and sown in March, believe it would have succeeded as well. I did not learn in what manner they prepared their wheat in Newtown for sowing, although I requested the inquiry made, but from the Agricultural Society lately established in Essex, we have a fair right to calculate on all the information on the subject that can in any way benefit the community. I have also enclosed a memorandum of some very heavy crops of wheat raised last year in Boscawen, State of New Hampshire.

And am, with respect and great regard,

Your very humble servant,

GORHAM PARSONS.

Our number having reached its usual size, we are constrained to give only an abstract of the information furnished in the above letter. It appears that in the single district of Newbury-Newtown, there were raised in 1817, by thirty-two persons, on 58 acres of land, 1325 bushels of wheat,

making an average of twenty-two bushels to the acre, an average greater, we believe, than that of the most favourable wheat countries. One person, Mr. Moses Emery, raised thirty-three bushels and an half to the acre; and another, Joseph Newhall, Esq. raised eighty-one bushels on two acres and an half.

In Boscawen, New-Hampshire, five persons, the same year, raised on eleven acres, 352 bushels; precisely thirty-two bushels to the acre.

The present year has been unfavourable to English grain, but not more so than that of 1816 was to Indian corn. We hope and trust the culture of wheat will not be abandoned. Early sowing, and thorough ploughing, will, we hope, render it as secure as any crop, except potatoes.

Quincy, 25th July, 1813.

[To the Corresponding Secretary.]

SIR,

As it is a subject of some interest to those who may engage in raising thorns for live hedges, to know how to make the seed germinate the first year, I take the liberty to inclose a letter on that topic. It was written to me in 1811, by Thomas Main, a scientific and very successful nurseryman, in the neighbourhood of Georgetown. He considered the process as an important discovery. Mr. Main is now dead; if there be any thing new, he ought to have the credit of it. I therefore send you the entire letter, and submit it to the judgment of the Trustees, whether it be not important enough to be inserted in their Journal.

I have never had occasion to make any use of the process, but from its simplicity, from the great success Mr. Main had in this branch of his business, and his confidence in its efficacy, I have no doubt it will be found all that he states it to be. Very respectfully, I am, &c.

JOSIAH QUINCY.

PROCESS FOR GERMINATING THE SEEDS OF THE AMERICAN HEDGETHORN AND PYRACANTHA.

The berries of either of the above plants, at any time after they are fully ripe, are to be gathered, and the stones extricated from the pulp by any convenient mechanical means. I commonly put the berries into a trough, and crush them with a wooden pestle, turning over the mass repeatedly, and continuing the operation until the end is completed, so as not to break the *stones*; which are then to be washed clean from the mass, and deposited in a box, barrel, or any convenient vessel, and being covered with damp leaves, or green moss, the vessel is to be placed, out of doors, in the coolest situation that can be obtained, to *retard* the seed from sprouting until the risk of frosty weather is as far over, as conveniently can be obtained. As soon as vegetation commences, the seed are to be inspected every two, or three, or four days, according to the temperature of the atmosphere. When, on being handled, the stones feel slimy, they are then about to open, and must be strictly watched if the weather is warm; for as soon as the shells begin to open, and the little rootlet of *some of them* appears protruded, it is then the exact time to sow them. The whole process may be summed up in one sentence, viz. clean the stones from the pulp, and keep them damp (or frozen) during the winter.

The simplicity and complete efficacy of this process is what has puzzled every person to find it out; for so far as I know, no other person has discovered it by their own experiment.

The seeds of the pyracantha, being extremely small, are to be closely examined and strictly watched as the spring advances, so as to have them sowed at the critical juncture, (before the root is too far protruded) and covered after they are sown, with less than half an inch of very fine mould, sifted or scattered equally over them.

Although it is not essentially necessary to wait until the lobes of the stones begin to open, nevertheless the seed always come up the freest and quickest, when they are sown just at that period; and I have uniformly had the best success, when the weather and condition of the soil gave me an opportunity to sow them then.

Any further information, or explanation, which you may require concerning this article, will be most promptly and cheerfully communicated.

T. MAIN.

Main's Nursery, District of Columbia, Feb. 28th, 1811.

Note. I generally mix the seed plentifully with plaster of Paris, at the time of planting, in order to separate them the better, as they grow better when scattered. About an inch apart, seed from seed, is the best method; a little wider for the pyracantha.

T. M.

AGRICULTURAL INTELLIGENCE.

THE Massachusetts Agricultural Society caused to be imported at their own expense the last spring, in addition to the implements mentioned in the last Journal, the Northumberland double-mould-board-plough, considered among the best yet invented in England. Its mould boards are of cast iron, and so contrived, that they may be expanded more or less at the pleasure of the person who uses it, and according to the nature of the soil and the distances which it is proposed to place the rows of plants. It is chiefly intended for ridge work, where carrots, beets, the mangel wurzel, or root of scarcity, or white beet (for it is known by all these names) or the ruta бага, or Swedish turnip, are sown. It would also very well answer to pass between cabbages or potatoes, planted or sowed in continuous rows. This

instrument is now used by the Hon. Mr. Quincy, and is much approved by him.

The Society have also introduced the couch-grass scarificator, an instrument in great and very popular use in England for cleaning lands of couch or twitch grass, and would be also applicable for the purpose of cleaning lands of the Canada thistle, nettle, or any other noxious plants whose roots extend into, and cover the soil. It is also a very useful harrow. It is easily managed by a single horse, and will do as much work in one day as could be done in three, with the same number of hands employed with instruments heretofore in use. This has been tried, and is in the possession of John Prince, Esq. of Jamaica Plains, Roxbury.

They have also imported a mill for grinding small grain, but it does not, at present, appear to promise advantages equal to their expectations. Also a hand-hoe, to be drawn by men, and to weed where it would be dangerous to use a horse. Likewise, a machine for sowing turnip seed, very simple, light, and effectual.

The great object of the Society is, to bring into the country, specimens of improved machines, from which it is hoped our ingenious artists will be enabled to derive hints, and to furnish others better adapted to our necessities and soil, and mode of cultivation, and at prices suited to the means of our farmers.



The Hon. Mr. Thorndike has placed at the disposition of the Society, the bull and one of the cows imported by him the last season from the Low Countries. This breed has been long celebrated for its excellent qualities for the dairy, in which, if in any thing, our stock of horned cattle is deficient. In reference to this quality, this bull has received the name of *Fill-pail*. He has stood this season at Brighton, where he has been very considerably used, but

not so much as we hope he will be in another year. He is one of the finest animals of his age, that has been seen here; of very compact form, and very vigorous. We shall be better able to decide on his merits, when we see his progeny; but it is hoped the more opulent gentlemen and farmers, who have excellent cows, will try him for the sake of advancing the interests of agriculture, although it may be of no personal advantage to themselves.

Mr. Charles Thorndike, son of the Hon. Mr. Thorndike, has also ordered a bull and two cows from Portugal, and has imported a pair of fine asses, one of each sex, from St. Michaels. Such examples deserve the approbation of the public. It is only by trials and experiments, that any improvement in the races of animals has been made. If we were to see the horse on which Alfred the Great rode, after his restoration to the throne, we should hardly recognize the sire of the present high mettled racer, hunter, and coach horse of modern Britain. We must look to Africa and the shores of Barbary, for the stock which amended their race of horses.

The present season has been, in general, propitious. An unusually great, but extremely needed quantity of rain, in the early part of the season, filled all the rivulets and springs, raised the lakes and ponds, and it is hoped gave a supply for the lower springs, which will enable us to sustain one or two seasons of deficiency. These rains were followed by a high degree, and continuation of heat, (we do not speak with the accuracy of men of science, but as farmers) of which we have no recollection for twenty-five years.

The crop of English hay has been, within twenty miles of Boston at least, abundant; more than an average crop, as it is said, thirty per cent. The price of new English hay, at twenty miles distance from Boston, is at present

(July 25th) fifty-five cents a hundred. The meadow hay will be considerably deficient.

English grain generally, thereby intending wheat and rye, barley and oats, do not promise so well as in cold seasons. Some exceptions, of course, exist as to all these grains. The Hessian fly has been more destructive than usual here, and blight has prevailed since the extreme drought and cloudy mornings. The drought, which lasted thirty-two days with very trifling showers not sufficient to lay the dust, affected injuriously pease, early potatoes, and began to operate on Indian corn and grass; but the showers in the latter part of July will probably revive vegetation, and restore the uncommonly good prospects of the early part of the season, and thus make it a year of unusual abundance. Fruits of luxury are to be excepted. The promise and the crops of these, which are past, have been less than usual.

Insects of all sorts have abounded beyond all example. And why not? In years of great abundance, the inferior orders of creation ought to share with us the goodness of Providence.

The Trustees of the Massachusetts Agricultural Society, with a view of giving better accommodation to ingenious artists, who are inventors of machines and implements for agricultural purposes, and of affording a better place to display our domestic manufactures, have called upon the opulent in the capital, to furnish them with funds to erect a suitable edifice for these purposes. This call has been, as usual, answered with a generosity and spirit worthy of the metropolis of a great state, ranking among the first in numbers and opulence, and yielding to none in public spirit and intellectual cultivation. Numbers of the rich have subscribed very liberally, and we now feel assured, indeed we never had doubts, that we shall be able to give more respectability and accommodation at the Annual Cattle Show.

The Trustees have unanimously decided to fix the show at Brighton, though the proprietors of Lechmere's point-very liberally tendered them accommodations at that settlement. The greater distance from town, and the consequent accommodation to the country, as well as the avoiding too much bustle and noise, induced the decision.

Marshall, a very celebrated writer on husbandry in England, speaking of the county of Hereford, says, "One circumstance in the management of cattle in this county is matter of some surprise. The spaying of female calves is not here in practice. This circumstance is more remarkable, as the excellency of spayed heifers, not only for draught but as fattening cattle is indisputable; and still more extraordinary, as Herefordshire not being a dairy county, numbers of female calves must every year be fattened for the butcher. How much more eligible it might be, to castrate indiscriminately the handsomest and cleanest of such males or females, not wanted for the purpose of breeding, as drop in rearing season." It would seem from this extract, that the usage of spaying heifers is pretty general in England, or the conduct of the Herefordshire farmers in omitting it, would not have appeared remarkable. We had, indeed, often read of the famous spayed heifers of Norfolk, but did not understand the practice to be general.

Is it ever practised in this state? And with what success? are questions we should wish to have answered.

It certainly would be desirable, that thousands of our miserable milch cows, which, on an average through the year, do not give four quarts of milk per day, were converted into beasts of draught, and fattened, and their places supplied with cows adapted to the dairy. In short, (for we know the objection would be, that there is not fodder enough for both purposes) let us have fewer cows, better fed, and let the superfluous females be spayed, and turned into beef.

Mr. Marshall, next to Arthur Young, one of the most indefatigable and attentive observers of agricultural processes in England, has given, very much in detail, the course of proceeding in all the most celebrated cheese counties of Great Britain. It might be very valuable here (if it was deemed useful there) to give the history of these proceedings at length.

We have certainly advanced more in the quality of our cheese, than in any one article of agricultural produce.

It may be thought, that we shall arrive soon enough at perfection in this art, without foreign information; yet the progress is slow. Experience, undoubtedly, is the best guide. It is what first formed the reputation of the Gloucestershire and North Wiltshire dairies. To this must be added, encouragement from demand and luxury, which decides, and requires, and remunerates industry and care.

Yet in an extensive country, excellent methods in use for the manufacture of a particular article, may be long confined to small districts, without being brought into general use, unless attention is drawn to the subject, and the practices of the best manufacturers made known by publications. This is one of the uses of general societies. We have not room in the present number, now drawing to its close, to insert the practices of the celebrated cheese-makers of Gloucestershire, Cheshire, and North Wiltshire; but it may amuse and awaken the attention of our farmers and dairy women, to have some detached and separate facts stated, from the experience of these celebrated dairy farms.

It seems, that great reliance is put in making the best cheeses, on the *heat* of the *curd*. They are not so particular, Marshall says, as to the heat of the milk when the rennet is put in. Milk (in Gloucestershire) is considered as *too warm*, direct from the cow. If the skim-milk of the last milking is not sufficient to reduce it to the requisite degree of coolness, even cold water is added, though Mr. Marshall condemns this practice.

It is not to be expected, that dairy women will use thermometers to ascertain the degrees of heat in their milk or curd, but it may be useful and curious to state, that experience seems there to have decided, that although the heat may be at eighty-six of Fahrenheit when the rennet is applied, yet it was found that the *curd*, in many repeated experiments, *came precisely* when the heat was at eighty.

The heat of the milk, when the rennet was put to it, varied from eighty-eight to eighty-three, or from ten to fifteen degrees below blood heat; yet, in almost every case, the curd did not come till the heat had fallen to eighty.

There are also varieties in the practice, as to *scalding* the curd; some using whey, others water only, and others whey and water mixed. The same differences of practice occur in the salting. In some of the *best dairies* no salt is used in the curd itself, before it is put into the press; but after it has been partially pressed, the cloth is raised, and salt is applied to the surface, after the cheese had been in the press three hours. In the evening, those made in the morning are again turned, and again salted, in the same manner, by an application of salt to the surface.

This was the practice of two of the most celebrated dairies visited by Mr. Marshall.

We have understood, that one of our most famous cheese-makers in this neighbourhood, whose cheeses are in almost as much reputation here, as the Gloucester cheeses in England, has adopted this mode of salting. If this be an error, we should be glad to be informed, as also to receive any information of the practices of the most successful dairies in our country.

Cheeses in Gloucestershire stand in the press forty-eight hours, which, we believe, is much longer than they generally are suffered to stay with us.

The cheeses are washed in water or whey, after they come out of the press; and it is one test of the solidity of the cheese. Cheeses, rich in quality and well manufactured, sink; if porous, or full of eyes, or hollow, they swim.

By pretty accurate calculations, it has been found that it takes, in Gloucestershire, about one gallon and one third of milk, to make one pound of cheese. In some instances, one gallon to a pound.

Upon an experiment with a dairy of *forty cows*, it was found that, upon an average, the whole being devoted to cheese-making, the cows made each three gross hundred weight of cheese, or 336 net pounds, in a year.

Mr. Marshall allows about four acres of land a year, for the support of a cow, winter and summer.

The quantity of cheese made from a cow, on an average of a whole dairy, seems to exceed, very considerably, what appears from the returns to be made in this state. This is undoubtedly owing, in a great measure, to a greater attention to the selection of good cows, and to their being better fed.

The Secretary of the Treasury, the Hon. Mr. Crawford, sent to the Corresponding Secretary of this Society, some hemp, flax, and saintfoin seed, received by the government from the Consul of the United States at Leghorn. This seed has been distributed, and is now growing in the grounds of some of the Trustees. The hemp and flax appear to be very fine. It was remarked by the Consul, that the Italian hemp and flax were considered superior to any in Europe; at least, that they bore a higher price in that market.

If the birds shall leave any seeds at the end of the season, and it is very difficult to preserve any, when the experiment is made on so small a scale, notice will be given, and the seeds distributed to any publick-spirited gentlemen, who are disposed to take charge of them. In the mean time, the Society deem it a duty to express their grateful sense of the attention of the National Government to the interests of Agriculture

DESCRIPTION OF A MOULD-BOARD, EXTRACTED FROM A LETTER, DATED MARCH 23d, 1798, FROM MR. JEFFERSON TO SIR JOHN SINCLAIR, PRESIDENT OF THE BOARD OF AGRICULTURE AT LONDON, PRINTED IN THE 4th VOLUME OF THE TRANSACTIONS OF THE AMERICAN PHILOSOPHICAL SOCIETY IN PHILADELPHIA.

In a former letter to you, I mentioned the construction of the mould-board of a plough which had occurred to me, as advantageous in its form, as certain and invariable in the method of obtaining it with precision. I remember that Mr. Strickland of York, a member of your board, was so well satisfied with the principles on which it was formed, that he took some drawings of it; and some others have considered it with the same approbation. An experience of five years has enabled me to say, it answers, in practice, to what it promises in theory. The mould-board should be a continuation of the wing of the ploughshare, beginning at its hinder edge, and in the same plane. Its office is to receive the sod horizontally from the wing, to raise it to a proper height for being turned over, and to make, in its progress, the least resistance possible; and, consequently, to require a minimum in the moving power. Were this its only office, the wedge would offer itself as the most eligible form in practice.* But the sod is to be turned over also. To do this, the one edge of it is not to be raised at all; for to raise this would be a waste of labour. The other edge is to be raised till it passes the perpendicular,

* I am aware, that were the turf to be raised to a given height, in a given length of mould-board, and not to be turned over, the form of least resistance would not be rigorously a wedge with both faces straight, but with the upper one curved, according to the laws of the solid of least resistance described by the mathematicians. But the difference between the effect of the curved and of the plain wedge, in the case of a mould-board, is so minute, and the difficulty in the execution which the former would superinduce on common workmen, is so great, that the plain wedge is the most eligible to be assumed in practice of the first element of our construction.

that it may fall over with its own weight. And that this may be done, so as to give also the least resistance, it must be made to rise gradually from the moment the sod is received. The mould-board then, in this second office, operates as a transverse, or rising wedge, the point of which sliding back horizontally on the ground, the other end continues rising till it passes the perpendicular. Or to vary the point of view, place on the ground a wedge of the breadth of the ploughshare, of its length from the wing backwards, and as high at the heel as it is wide. Draw a diagonal line on its upper face, from the left angle, at the point, to the right upper angle of the heel. Bevil the face from the diagonal to the right bottom edge, which lies on the ground. That half is then evidently in the best form, for performing the two offices of raising and turning the sod gradually and with the least effort: and if you will suppose the same bevil continued across the left side of the diagonal, that is, if you will suppose a straight line, whose length is at least equal to the breadth of the wedge, applied on the face of the first bevil, and moved backwards on its parallel, with itself and with the ends of the wedge, the lower end of the line, moving along the right bottom-edge, a curved plane will be generated, whose characteristic will be, a combination of the principle of the wedge in cross directions, and will give us what we seek, the cross board of least resistance. It offers too this great advantage, that it may be made by the coarsest workmen, by a process so exact, that its form shall never be varied a single hair's breadth. One fault of all other mould-boards is, that, being copied by the eye, no two will be alike. In truth, it is easier to form the mould-board I speak of with precision, when the method has been once seen, than to describe that method either by words or figures. I will attempt, however, to describe it. Whatever may not be intelligible from the description, may be supplied from the model I send you.

Note by the Editor.—We are sensible this is very imperfect without the model or plates; but it may suggest ideas to some of our very ingenious mechanics, who are constantly employed in devising improvements in our agricultural implements.

Brighton, 16th January, 1818.

[To the Corresponding Secretary.]

DEAR SIR,

The specimen of Indian corn exhibited at the meeting of the Trustees, at your house in October, was from the product of an ear, received from Vermont as *a very early variety*. It was planted 29th of May, 1816, and all ripened, when two other sorts, in the same field, were destroyed by the frost. The last season I planted a small patch on a warm soil, and south aspect, the sixth of May; the most forward ears were gathered green, the remainder harvested, full ripe, the 4th of September. Another patch, on a northwest exposure, was planted the 6th of June; the 1st of September the whole was so ripe as to be secure from frost. It was in this same field, with a sort generally planted in this neighbourhood, received the same culture, was equally as productive, and from fifteen or twenty days more forward; the stalks, however, are much more dwarf. Deeming it of importance, that this variety should be disseminated throughout the Commonwealth, I propose, with the approbation of the Trustees, to furnish Mr. Kuhn, the Messenger, with a quantity sufficient to distribute an ear to each member of the Legislature.

I have long been aware, that too much dependence has been placed on our crops of Indian corn, without sufficient attention to the habits of the plant; and apprehend the error to arise from its indiscriminate culture. Were we to select the earliest productive varieties for seed, and plant

only our warm light soils, it may be considered as sure a crop as any ; and profitable also, I presume to hint, if connected in a three years' rotation with spring wheat and clover. Do we not err in attempting to keep our dry light soils down to herds'-grass and the natural grasses, for hay and pasture? On such soils, corn may be one of the best preparatory crops for wheat, which delights to follow the high manuring, and deep, clean culture requisite to obtain a good crop of corn ; and should the course be pursued of sowing clover with the wheat, to be mown once, and the after growth, in its most succulent state, turned in, would not our lands, of the above description, not only be in a progressive state of improvement, but afford as much fodder as by the system commonly pursued? And the culture of corn, instead of superseding that of wheat, eminently promote it?

I remain, dear Sir, with respect, very cordially yours,

S. W. POMEROY.

CATTLE SHOW, EXHIBITION OF MANUFACTURES, AND PLOUGHING MATCH, AT BRIGHTON, ON TUESDEY AND WEDNDSDAY, THE 13th AND 14th OF OCTOBER, 1818. TO COMMENCE AT NINE O'CLOCK, A. M. ON EACH DAY.

THE Trustees of the Massachusetts Society for the Promotion of Agriculture, encouraged by the renewed patronage of the Legislature of this State, intend to offer in Premiums, not only the sum granted by the Government for that purpose, but also the whole amount of the income of their own funds ; they, therefore, announce to the public, their wish to have a Cattle Show, and Exhibition of Manufactures, at Brighton, on Tuesday and Wednesday, the 13th and 14th of October, 1818 ; and they offer the following Premiums :—

FOR STOCK.

For the best Bull, raised in Massachusetts, of any age, - - - - -	\$ 40
For the next best, do. do. do. - - - - -	25
For the best Cow, of any age, - - - - -	40
For the next best do. do. - - - - -	30
For the next best do. do. - - - - -	20
For the best Ox, fitted for slaughter, and weighing not less than 1800 wt. - - - - -	50
For the next best do. of any weight, - - - - -	40
For the next best do. do. - - - - -	30
For the best pair of Working Cattle, - - - - -	40
For the next best do. do. - - - - -	30
For the next best do. do. - - - - -	20
For the best Merino Wethers, not less than six in number, - - - - -	20
For the next best do. do. do. - - - - -	10
For the best native Wethers, not less than six in number, - - - - -	10
For the next best do. do. do. - - - - -	5
For the best Merino Ram, - - - - -	20
For the next best do. - - - - -	10
For the best Merino Ewes, not less than five in number, - - - - -	30
For the next best do. do. - - - - -	10
For the best Boar, not exceeding two years old, - - - - -	15
For the next best do. do. - - - - -	5
For the best Sows, two in number, not more than four, and not less than one year old, - - - - -	10
For the best Pigs, not less than two in number, not less than four months old, nor more than eight, - - - - -	10
For the next best do. do. do. - - - - -	5
For the best imported Bull, owned, and to be kept in the state of Massachusetts, for at least one year after this Cattle Show, - - - - -	100

For the next best do. do. do. as above, - - -	75
For the best imported Milch Cow, do. as above, - - -	75
For the next best do. do. do. - - -	50

No animal, for which to any owner one premium shall have been awarded, shall be considered a subject for any future Premium of the Society, except it be for qualities different from those for which the former premium was awarded.

Any of the above stock (Wethers excepted) when raised and still owned at the time of exhibition, by the person who raised them, will entitle the claimant to an allowance of ten per cent. in addition.

FOR AGRICULTURAL EXPERIMENTS.

To the person who shall raise the greatest quantity of Wheat, on an acre, - - -	\$ 40
To the person who shall raise the greatest quantity of Carrots, on an acre, - - -	30
To the person who shall raise the greatest quantity of Potatoes, on an acre, - - -	30
To the person who shall raise the greatest quantity of Turnips, on an acre, - - -	30
To the person who shall raise the greatest quantity of any other Vegetable, suitable for the winter food of animals, and which shall equal in quantity, per acre, the greatest premium product, in this state, of either of the three preceding Vegetables,	30
To the person who shall introduce any Grass, not before cultivated in this state, and prove, by actual experiment, and produce satisfactory evidence of its superiority to any now cultivated, -	30
To the person who shall give satisfactory evidence on "Soiling Cattle," not less than six in number, and through the whole season, together with a particular account of the food given, and how cultivated, - - - - -	30

To the person who shall make the experiment of turning in green crops as a Manure, on a tract not less than one acre, and prove its utility and cheapness over any other manure, giving a particular account of the process, and its result, - - - 30

To the person who shall, by actual experiment, prove the best season and modes of laying down lands to grass, whether spring, summer, or fall seeding be preferable, and with or without grain, on different soils, - - - - - 30

To entitle himself to either of the Premiums, under this head of Agricultural Experiments, the person claiming, must cultivate a tract of at least one acre in one piece, with the plant or production for which he claims a premium; and must state, in writing, under oath of the owner, and of one other person (accompanied by a certificate of the measurement of the land, by some sworn surveyor) the following particulars :—

1. The state and quality of the land, in the spring of 1818.
2. The product, and general state of cultivation and quantity of manure, employed on it the year preceding.
3. The quantity of manure used the present year.
4. The quantity of seed sown.
5. The times and manner of sowing, weeding and harvesting the crop, and the amount of the product, ascertained by actual admeasurement of the whole produce for which a premium is claimed.

The claim must be entered on the days hereinafter established for entering for the Premiums; but the evidence of the actual product need not be produced until after the Cattle Show, and at any time preceding the first day of the ensuing December: the Trustees not intending to decide upon claims, under the head of Agricultural Experiments, until their meeting in December.

FOR INVENTIONS.

To the person who shall invent the best, simplest, and least expensive Machine for threshing Wheat, or any small Grains, - - - -	\$ 75
To the person who shall invent the best, simplest, and least expensive Machine for sowing small Seeds on an extensive scale, - - - -	30
To the person who shall exhibit the best Plough, for common purposes, of an improved construction, and of his own invention, - - - -	20
To the person who shall use the Drill Plough, or Machine, and apply it most successfully to the cultivation of any small Grains or Seeds, on a scale not less than one acre, - - - -	20
To the person who shall produce at the Show any other Agricultural Implement of his own invention, which shall, in the opinion of the Trustees, deserve a reward, - - - -	20

In all cases, proof must be given of the work done by the Machine, before it is exhibited; and of its having been used and approved by some practical farmer.

It is not the intention of the Society to grant a premium for any *patented implement*, unless the proprietor surrender said patent right to the Society, for the use of the state of Massachusetts, for an additional sum not exceeding the amount of premium.

FOR DOMESTIC MANUFACTURES.

To the person or corporation who shall produce the best specimen of fine Broadcloth, not less than 1 5-8th yards wide, exclusive of the list, 40 yards in quantity, and dyed in the wool, - - - -	\$ 30
For the best second do. do. do. - - - -	20
For the best superfine Cassimere, not less than 3-4th yard wide, nor less than 40 yards in quantity, -	15

For the second best do. do. do. - - - -	10
For the best superfine Satinet, 3-4th yard wide, not less than 50 yards, - - - -	10
For the second best do. do. do. - - - -	6
To the person or corporation, who shall produce the best specimen of Cotton Cloth, manufactured in this state, not less than 50 pieces, - - - -	20
To the person who shall produce the best specimen of any other fabrics of Cotton, manufactured in this state, in public factories, not less than 50 pieces, - - - -	20
In private families, not less than five pieces, -	20

FOR HOUSEHOLD MANUFACTURES.

For the best Woollen Cloth, 3-4ths yard wide, not less than 20 yards in quantity, - - - -	\$ 12
For the second best do. do. - - - -	8
For the best double milled Kersey, 3-4ths wide, not less than 20 yards in quantity, - - - -	12
For the second best do. do. - - - -	8
For the best Coating, 3-4ths yard wide, and not less than 20 yards in quantity, - - - -	8
For the second best do. do. - - - -	6
For the best Flannel, 7-8ths yard wide, not less than 45 yards in quantity, - - - -	10
For the second best do. do. - - - -	7
For the best do. 4-4ths yard wide Carpeting, not less than 30 yards in quantity, - - - -	15
For the second best do. do. - - - -	7
For the best 5-8ths yard wide Stair Carpeting, not less than 30 yards in quantity, - - - -	10
For the second best do. do. - - - -	7
For the best pair of Blankets, not less than 8-4ths wide and 10-4ths long, - - - -	6
For the second best do. do. - - - -	4
For the best Woollen Knit Hose, not less than 12 pair in number, - - - -	5

For the second best do. do.	- - -	3
For the best Men's Half Hose (woollen) not less than 12 pair in number,	- - -	4
For the second best do. do.	- - -	2
For the best Men's Woollen Gloves, not less than 12 pair in number,	- - -	5
For the second best do. do.	- - -	3
For the best Linen Diaper, 5-8ths yard wide, and not less than 30 yards in quantity,	- - -	5
For the second best do. do.	- - -	3
For the best 4-4ths yard Diaper (for table linen) not less than 30 yards in quantity,	- - -	10
For the second best do. do.	- - -	5
For the best specimen of Sewing Silk, raised and spun in this state, of good fast colours, not less than one pound,	- - -	5
For the second best do. do.	- - -	3
For the best Linen Cloth for Shirting or Sheeting, one yard wide, and 25 yards long,	- - -	8
For the second best do. do.	- - -	4

All the above Manufactures, when of wool or flax, must be of wool or flax of the growth and manufacture of the state of Massachusetts. And all Manufactures, when presented, must have a private mark.

For the best Butter, not less than five tubs, nor less than 50 pounds each,	- - -	\$ 10
For the second best do. do. do.	- - -	5

It is understood, that whenever, merely from a want of competition, any of the claimants might be considered entitled to the Premium, under a literal construction, yet if, in the opinion of the Judges, the object so offered is undeserving of any reward, the Judges shall have a right to reject such claims.—Persons to whom Premiums shall be awarded, may, at their option, have an article of Plate, with suitable inscriptions, in lieu of money. Premiums will be paid within ten days after they shall be awarded.

The Trustees of the Massachusetts Society for Promoting Agriculture, hereby give notice, that they intend, on the second day of the Cattle Show, viz. on the fourteenth day of October next, to give Premiums to the Owners and Ploughmen of the three Ploughs, which shall be adjudged, by a competent Committee, to have performed the *best work with the least expense of labour*, not exceeding half an acre to each Plough, and of such depth as the Committee shall direct.

The first Plough,	\$ 20	Second Plough,	\$ 12
Ploughman,	10	Ploughman,	6
Driver,	5	Driver,	3
Third Plough,		\$ 8	
Ploughman,		4	
Driver,		2	

In each case, if there be no Driver, both sums to be awarded to the Ploughman.

The persons engaging in the Ploughing Match, must own their respective Ploughs, and Cattle; and the Ploughman, (if he be not the owner) must be a man employed on the owner's farm.

The persons intending to contend for the Prizes, must give notice in writing to S. W. POMEROY, or GORHAM PARSONS, Esquires, of *Brighton*, on or before the first day of October, so that proper arrangements may be made for the purpose. No person will, on any consideration, be admitted without such notice. The competitors will also be considered as agreeing to follow such rules and regulations as may be adopted by the Committee appointed on the subject. The Ploughs to be ready to start at nine o'clock, A. M.

The result of the last Ploughing Match at Brighton, and the satisfaction expressed by so many of their Agricultural brethren, will induce the Society to continue these Premiums annually, in connexion with the Cattle Show, as an

efficacious means for exciting emulation and improvement in the use and construction of the *most important instrument* of Agriculture.

Persons intending to offer any species of Stock, or any Article or Experiment whatever, for Premium, are requested to give notice thereof, either by letter (post paid) stating the Article or Experiment, or to make personal application to Mr. JONATHAN WINSHIP, at *Brighton*, on or before the twelfth day of October, and requesting him to enter such notice or application, so that tickets may be ready at nine o'clock of the thirteenth. No person will be considered as a competitor, who shall not have given such notice, or made such application for entry, on or before the time above specified.

The applicants will be held to a rigid compliance with this rule relative to entries, as well as to the other rules prescribed.

The examination of every species of Stock (except Working Oxen) and of Domestic and Household Manufactures, will take place on the thirteenth; and the trial of Working Oxen, examination of Inventions, and Ploughing Match, on the fourteenth of October.

By order of the Trustees,

JOSIAH QUINCY,

Chairman of Committee of Premiums

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* The name of the Hon. Mr. Hoyt was omitted in a list published in a former No. although he was then a member.

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Stenocorus pulator

Fig. 1



Fig. 2



Fig. 3



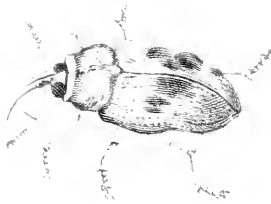
Fig. 4



Fig. 5



Fig. 6



Stenocorus Cerasi

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AN ADDRESS DELIVERED BEFORE THE MASSACHUSETTS
AGRICULTURAL SOCIETY AT THE BRIGHTON CATTLE
SHOW, OCTOBER 13, 1818. BY J. LOWELL.

I HAVE been requested, by the Trustees of the Massachusetts Agricultural Society, to open the proceedings of this day (after suitable acknowledgments and supplications should have been made to the Author of all our blessings) by some remarks adapted to the occasion. I shall not adopt the usual course of a declamatory harangue, because it has become too common, and implies a distrust in the good sense of an audience. It seems to presuppose, that they have not judgment, patience, and taste, sufficient to relish a plain and unornamented discourse, appropriate to the peculiar objects of such an institution. In other words, one would not wish to subsist altogether on honey or even nectar. But the most powerful motive which influenced my decision was, that if a more elevated and finished style of oratory had been thought necessary, it would have been improper in one, educated at the very point of time, in which the literature of our country experienced its most extreme depression, to present himself before any audience, whose taste has been formed on higher and purer models. Believing that the simplicity and plainness of such an essay

should correspond, both with the subject and the diversity of character, which may be supposed to exist in such an audience on such an occasion, I have not declined a duty which through the partiality of the Trustees has devolved upon me. Had the present assembly been a collection of literary men alone, and designed to exhibit a specimen of our proficiency in oratory and the belles lettres, I should have been compelled to decline the task, as one utterly above my powers.

Agriculture (I beg the indulgence of the venerable fraternity of Masons) is the most *ancient* human art. It would not be extravagant to say, that it is also the most *important*; and if these two propositions are true, it deserves to be the most venerated and encouraged. Every man in the community owes to it, *directly* or indirectly, all his enjoyments, all his wealth.

However remote his occupations may seem from the pursuits of agriculture, yet on these, and these alone, he depends for his food and his emoluments. Stop the cultivation of the earth for a single season, and we should soon see of how little value are all other arts compared to this. National revenue would instantly cease, and all the vast establishments of the government, civil and military, would fall. The merchant, manufacturer, and financier, esteem themselves of the most vital importance to the state, and are apt to think too lightly of the interests, and of the silent labours of the Farmer, by which they all *exist*. They have to be sure, all of them, their subordinate and allotted share of usefulness; but in a correct and philosophical view, they are the *mere brokers of agriculture*. We would not be understood to intimate, that agriculture is not greatly indebted to the mechanick arts and to commerce, for its extension, its improvements, and its best rewards. But we would insist on the unquestionable truth, that it is the support and stay of all other arts. We think its value has never been duly appreciated, and that it has

never been admitted to its due rank, even in republican countries. In others, we know, it has always till lately been placed among the *inferior castes*; perhaps because its influence, like the sun and dews of heaven, is constant, familiar, and unobtrusive.

These are general expressions, and may be deemed by the inconsiderate, and by those who have made little reflection on the subject, extravagant. Let us then examine facts. Take Great Britain as an example, the most commercial and manufacturing nation in the world, and compare the vital importance of her agriculture with that of the other prominent and obtrusive arts. In that nation more than one half of all the families are engaged, either in commerce or manufactures. What do we find to be the relative importance of agriculture? The whole amount of the deficiency of agricultural products, in the article of bread stuffs, in the years of the greatest scarcity, does not exceed one 23d part of her consumption.

In the year 1817, which followed the most disastrous and dismal season known for a century in Europe and America, a year in which the *United States*, though pressed by the same untoward causes, furnished to Great Britain 500,000 barrels of flour, yet in that year all her imports of bread stuff only sufficed for the consumption of her population three weeks. For the remaining forty-nine, her merchants, manufacturers and her stockholders, however opulent, depended for their daily bread on the labour of her husbandmen. If the demand of Great Britain, instead of a 23d of her whole consumption, had amounted to one third, millions must have starved, and all the wealth of that nation would have been of no avail in stopping the overwhelming fury of that despair, which recognizes no law more imperious than hunger.

A single shower of rain, it has been judiciously and truly remarked, is of more actual value and profit to a nation than the gains of all its exterior commerce for a year.

Estimate our exports at 100 millions of dollars, and allow a net profit to the country of ten per cent. on every voyage, which, averaging the losses and gains, and the duration till the profit is realized, will be an ample one; for even we, with all our enterprize, and our rushing advances up the hill of prosperity, scarcely double our capital in ten years, and you derive but a meagre ten millions of dollars per annum. The loss to the whole nation, by a single year's failure in your crop of corn or hay, or the gain by one year of unusual fertility, would amount to double, or even five times this sum. Let any man take his pencil and make the most moderate calculations, and he will perceive the perfect truth and moderation of this estimate.

The goodness of Divine Providence has thus wisely ordained, that the subsistence and prosperity of the human race shall not depend on the caprices of fortune, or on the casualties and accidents to which their enterprize or cupidity may expose them, but upon causes and effects to a certain extent *always sure*, the fertility of the soil, and the general and invariable laws of nature, undisturbed by the mistaken calculations and rash adventures of man. In other words, the Almighty and Beneficent Ruler of the universe makes much more ample and certain provision of us, than the utmost stretch of human ingenuity and foresight could effect.

But grant, that agriculture is as important as you *represent*, to the prosperity, and even existence of a state, what relation or bearing has this truth, which we are all ready to admit, on *your* institution, and *your* efforts, *your* exhibition, and *your* holidays? In what manner do *they* contribute to the advancement or perfection of this art? Are they not institutions of mere show and parade, calculated to place in a prominent view the immediate actors in them, as men professing a regard to the publick good, without affording any substantial benefit to the important art which you profess to encourage?

These questions, which may be often secretly asked, though not avowed, lead us naturally to the consideration of two supposed objections, which we may fancy to be urged against the utility of such societies and such exhibitions. The first may be, that the art of agriculture is not an improveable one, by the usual and ordinary means by which other arts are advanced to perfection. That men employed in agriculture are in some degree self-taught, that there is an accumulation of knowledge derived from the experience of those who have gone before them, transmitted from father to son, and incapable of any accession from literature, science and invention. That it is an art too simple to admit of any such foreign and adventitious aids, and that the most ignorant farmer can teach the most intelligent theorists truths, which are worth abundantly more than all his theories. The second question is, that admitting agriculture to be an improveable art, in what manner do your associations, confined as they are, in their administration at least, to men who do not personally labour, who have served no apprenticeship to the art, how can they contribute to the increase and diffusion of correct agricultural knowledge?

These are the appropriate questions, which we propose to discuss at this time. We shall readily admit, that the best theoretical farmer (or, if you please, gentleman farmer) can never acquire that practical skill and adroitness, which can be learned like every other art, only by the actual personal exercise of it. I should never select a gentleman farmer to hold *my* plough, to cut *my* grass, or sow *my* seeds. There is a slight of-hand, a peculiar skill acquired in every art, which theoretical knowledge can never supply. This, however, is equally true in the mechanick employments. The art of hewing timber, or of executing a fine piece of carpentry or joiners' work, could never be acquired by reading all the ingenious and learned treatises, which have ever been written on the subject. But what carpenter or mason, engaged in the manual and practical part of

his profession *alone*, could have planned or executed those wonders of human art, the cupolas of St. Peter's and St. Paul's?

Yet Bramante, Michael Angelo and Sir Christopher Wren, the illustrious men who erected those monuments of human genius, were not practical carpenters or masons; and it is possible, that in some parts of the work they might have spoiled many valuable materials, by the inartificial and improper use of their planes or their chissels.

Apply the same reflections to the most perfect human art, that of ship building and navigation. I call it the most perfect, because the mechanism employed in the most improved modern ships, and in their management at sea, implies the greatest stretch of human ingenuity, may be considered the greatest exercise of mind over matter and the elements, exhibited in any common art. No man not bred to the sea, however great his powers, could exhibit the skill, the presence of mind, the resource in case of danger, the ingenuity which is ordinarily displayed by common seamen, regularly bred to this dangerous and enterprizing profession. Greater powers by far are called into action, than are ever exhibited in the peaceful pursuits of agriculture. And yet will you give no credit to Columbus, who united science with practical experience, and conducted the ignorant navigators of Europe, to the discovery of this vast and fair creation? Will you allow nothing to the discoverer of the magnetick powers, nothing to the inventors of the compass and quadrant? The art of navigation would have been at this day as contemptible, as it was when Æneas was twelve months making the voyage of a small part of the Mediterranean, (I do not enter into the minutiae of criticism, as to the duration of his voyage; I take the shortest,) if men in their closets, who would have grown pale at the sight of the ocean in a storm, and who could not have saved a ship in common and ordinary dangers, had not taught the illiterate, but experienced seaman, to tra-

verse the ocean fearlessly by scientifick rules, which he does not fully comprehend, but on which experience induces him cheerfully to rely.

Examine the more common arts, those which contribute more directly to our comfort, and in which ordinary skill might be supposed to be more adequate to their perfection. The arts of spinning and weaving are almost coeval with agriculture. Yet it was reserved for an English gentleman (in humble life) in no wise connected practically with the manufacturing art (Sir Richard Arkwright) to invent a machine by which millions of the human race have been spared from manufactures to agriculture, and by which the whole produce of human industry has been almost infinitely increased. To this man's ingenuity, and to that principally or alone, do the United States owe an export in the article of cotton, to the amount of thirty millions of dollars, equal to one third of the value of all its exports. So much has the *agriculture* of the United States been indebted to science and genius, wholly independent of the untaught skill of the farmer or mechanick. If all other human arts have been so much indebted to science and genius, to men not at all concerned in their actual exercise and profits, is it to be believed, that agriculture *alone* has owed no portion of its existing improvement to the same causes? Why should this be so? Is it, that this art is so extremely simple? Are there no principles in agriculture, capable or susceptible of elucidation, extension and improvement, by the aids of human genius and science?

Is this the only art which is born perfect? Does its history justify such an extraordinary assumption and belief? An untaught man, brought up on his father's farm, proud in his independence, and thinking it patriotism to prefer every thing which belongs to his own country, without knowing what *are* the productions of other regions, may believe, that this happy country always produced wheat, and rye, and potatoes; that apples and pears and all the finer fruits are

the spontaneous productions of our own soil. Such persons should be told, that our British ancestors once subsisted on oats like our horses, and that their swine were fattened on acorns and beach nuts. That we owe to men of enterprise and of more refinement than falls to the lot of many farmers, the introduction of the more valuable grains, and *all* the fruits which contribute to our luxury and enjoyment. That the potatoe, a native of the other hemisphere, was introduced into Europe but about two centuries ago, just before the short lived settlement of our country, by men of science and research; and that invaluable as it has proved to be, it made but a slow progress, retarded by the prejudices of common farmers in Europe, who long deemed it an insalubrious, and even poisonous food. This single fact, not to be questioned, demonstrative of the benefits of enterprise, learning and perseverance, is worth a volume of powerful argument. Some of our hearers may possibly suppose that our fine cattle and horses were the native productions of our own soil, or at least of Great Britain, from whom we imported them. Such persons should be undeceived, and should be informed that our Indian predecessors knew no animal more useful than the moose, and after them, than the bear, wolf, beaver and racoon; that our barbarous ancestors in Great Britain only possessed at the time of the Norman Conquest, a miserable race of small black cattle, which we should not permit to encumber our soil; and that the horse, so necessary both in agriculture, and in every other employment, is a native of Arabia and Asia. In this connexion, permit me to notice a prejudice which I have been very sorry to see exist; and which has found its way into the publick papers, against the efforts of this society to improve the breed of domestick animals, by importations from various countries of Europe. Is this prejudice worthy of an enlightened people? Is it founded on solid and just grounds? All the stock which we have, was imported from Great Britain. Our first set-

blers were principally poor. It is unreasonable to suppose they were at the pains, flying for their lives, as some of them did, to select the very best breeds. They probably took with them such as they possessed. But the breeds of Great Britain have been astonishingly improved since the emigration of our ancestors; while we, occupied in cultivating and subduing a wilderness, have not had the wealth or the leisure to attend to this subject, till the present golden age has dawned upon us. It should not be forgotten that the famous Chapin oxen which obtained the prizes the last year, and the still more astonishing Westbrook race, (which will be exhibited to you this day) are some of the fruits of this spirit of improvement, and of foreign importation.

It is however a pleasure, a delight, and source of gratitude to every patriotick man, that animals, however superior, do not degenerate, but improve under our climate, and upon our pastures; and the day will probably arrive, in which Europe in its turn, may eagerly seek after the improved breeds of New England.

Is it then extraordinary, that with the knowledge of these facts and this history, this society should be solicitous of trying every species of stock, as well as every agricultural implement or invention, which has obtained celebrity in Europe?

Nor is it these substantial and more important articles only, which the patriotism and intelligence of theoretical cultivators have introduced.

If we possessed the narrow list of the vegetables cultivated by the Pilgrims of New England, and should compare it with the rich and extensive catalogue of those which are now found in our gardens and fields, we should be surprised at the increase of the number, and the improvement in quality. Many varieties of the cabbage, the cauliflower, the Saba and Lima beans, the Swedish turnip, the white

beet or root of scarcity, the salsafy or oyster plant, the Lima or river Plate potatoe, the Cape of Good Hope lettuce, numerous varieties of excellent melons; and almost innumerable species of the finer fruits for the table, have been within the last half century introduced by persons, connected with such societies as the one which now solicits your attention and patronage.

Many new varieties of domestick animals have also been imported, and have contributed to the improvement of our own breeds, though having been silently scattered, and blended with our own races, their origin is forgotten; and in the pride of our hearts, we are induced to call them our own.

Shall we dare to mention the *Merino sheep*, or shall we awaken recollections of unsuccessful experiment, and individual loss, which will more than compensate the pleasure derived from this invaluable accession to our domestick flocks? But when we reflect that early efforts directed to any new object are generally unsuccessful, and the first adventurers in any new scheme are martyrs to their patriotism and zeal, (though their country ultimately reaps the benefit of them,) may we not take the liberty to plead the cause of this inoffending race of animals, and endeavour to shew, that the great efforts of this Society in encouraging their introduction, promise to be of incalculable benefit to our country? We surely are not responsible for the injudicious use which individuals may have made of so great a blessing. A man must be wholly ignorant of the history of Great Britain, who does not know, that to the products and the improvement of her sheep, she has been indebted for the largest portion of her agricultural and commercial power. Without pretending to justify that restricted policy, which has led her for more than six centuries to make the exportation of wool a capital offence, we may certainly learn from her experience, from her having made even her enemies tributary to her for the cloathing of the troops which

were arrayed against her, (for even France and the United States in the recent conflicts, did not disdain to encourage her manufactures in this manner,) we may certainly learn, that a nation, by encouraging such a staple commodity, may draw even from hostile countries the resources of her own power. The sheep of our state, (I speak from long personal observation,) are exceedingly degenerated from those of the country from which they were imported, both in point of size and fleece. To what causes this is to be attributed, we leave to others to decide, but we are not inclined to ascribe it to any fault in our climate or food, but rather to an inattention to the selection of our best animals for breeding, and to the indiscriminate condemnation of them to slaughter. Still Great Britain, with all these natural, and cultivated advantages in the breed of her sheep, and although she possesses two races or breeds peculiar to herself, the Ryeland and Southdown, which the partiality of her cultivators induces them to prefer, *even to the merino*, has been obliged to import the fleeces of the Spanish flocks, in order to enable her successfully to compete and contend with France in the production of the finer cloths. This she has uniformly done, to the amount of many millions of dollars per annum. That it is absolutely necessary for our country, if she would enjoy within herself the resources necessary to render her independent of foreign supply, to encourage a breed of fine woolled sheep, such as the merino, cannot be questioned; since we have no animals to be compared in point of fineness of fleece with the Ryeland and Southdown, and yet Great Britain, enjoying this peculiar advantage, is obliged to make immense importations of merino wool. That we ought not to be discouraged by the calamities which have fallen upon individuals engaged in this culture, who adventured in it with all the eagerness, extravagance and enthusiasm which distinguished the South Sea speculations, is apparent to every sober man. As a nation, we have made a fair experiment, and

though individuals may have suffered, the country has gained. We have proved, that they will endure our climate as well, and many excellent judges think, better, than our native flocks.

Let us state a few unquestionable facts, which should encourage us to persevere in this patriotick work. The merino sheep have succeeded for fifty years in the climate of Sweden, almost within the polar circle. In Saxony, whose temperature is at least as cold as that of New England, and where the sheep are, still more than with us, dependent on cultivated food, they have done better than in any part of the known world. The Saxons, we would hope, are not our superiours in intelligence and enterprise, though their cold and slow flowing blood may make them more patient, and less enthusiastick. Undismayed by the boldness and the dangers of transplanting an animal, a native of the finest climate of Europe, they introduced the merino into their icy region. Several years since, the number of merinoes in Saxony exceeded a million. The Saxons soon became not only the manufacturers of the finest cloths, but almost incredible to relate, they became the exporters of merino wool to the great mart of Europe, London, in which it bears a price double, sometimes even treble, that of the country from which it was originally derived. A case unparalleled, unless it be in the relative prices of Georgia Sea Island cotton, and that of Bengal, the native country of that invaluable plant. So much can human enterprise and industry effect, and such are its triumphs over climate, and we may almost say, over nature!! France, next to Saxony, has made the greatest efforts, and seems to be the most sensible to the value and importance of this animal, whose fleeces seem to be one of the richest gifts of providence to man, or at least to the inhabitants of the colder countries.

I could cite an hundred authorities from French writers, shewing the great benefits derived from the introduction of merino sheep; and it should be recollected, that their ex-

perience is not like *our own*, RECENT, but one of forty years. They never took the merino fever, but the progress with them has been gradual and constant; their experiments slow and cautious, and therefore entitled to higher confidence.

As a single example of French success in the encouragement of merino sheep, I shall cite the experiments of Mons. Morel de Vindé.

In 1805, only thirteen years since, he began an establishment with 2 rams and 92 ewes, of the merino breed. In eleven lambings, this moderate flock produced 1087 males, and 1001 females; total, 2188; of which he lost by disease, 354. He sold 534, and had remaining in good health at the end of eleven years, 1300, the produce of his original stock of 94. The money produce for that period, of this flock, was as follows. From the sales of wool, 33,381 pounds, which he sold at the moderate price of 40 cents per pound, (a price only two fifths of the average or even lowest price in Great Britain and America) he received in cash 13,600 dollars. From his sales of sheep, he realized 10,300 dollars. And his sheep on hand, valued at the rate at which the others were sold, were worth 26,000 dollars; making a total of gain in eleven years, from 94 merino sheep, of 49,000 dollars.

He estimated his remaining sheep at 20 dollars per head, which for so pure a flock cannot be deemed extravagant.

There is no fallacy in this statement, which I have been able to detect, monstrous as the result may appear to be, that from a capital of 1800 dollars in sheep, a produce of 50,000 dollars had been realized in eleven years.

The question, then, is as to the author's veracity. We have only to remark, that taking into consideration his high standing in society, and that of the work in which his account appeared, Mons. Tessier's annals of French agriculture, the most respectable in that nation; taking also into

the account, that his statements were fully believed in that sagacious and disputing country, we think as much credit is due to it, as to the statements published by this Society of the size of the Chapin oxen, or the unexampled rapidity and skill with which our ploughing matches were performed the last year. Yet who would doubt the correctness of the accounts of this Society, watched as we are by a thousand vigilant eyes?

M. Morel de Vindé, the author of the above successful and patient experiment, furnishes another argument in favour of merino sheep, which we, and we doubt not that you, will esteem of vastly higher importance. He remarks, that wherever merino sheep have been introduced in France, the whole course of the agriculture of the country has instantly improved. He does not repose this assertion upon the credit of his own reputation and opinion, but gives the following natural and rational solution of it. With respect to other sheep, he remarks, the farmer calculates chiefly on the profits derived from their *death*. But as to the merino, he relies principally on their preservation and *lives*. In other words, ordinary sheep are principally raised for the *butcher*; these for the *manufacturer*. The one for their *carcasses*; the other for their *fleeces*.

With these utterly discordant views, it becomes necessary for the raiser of *merino* sheep, to keep them longer, to preserve them carefully, and to increase their number; but as this would be impracticable, in the common, old fashioned, careless mode of cultivation, as the ordinary produce of neglected farms will not suffice to keep over so large a number of sheep, farmers who would raise this species of sheep are compelled to adopt a better system, to break up more land, to try new plants and vegetables, to convert their farms into extensive gardens, in order to furnish food for these very profitable animals in the winter season. Thus he remarks in every district of France,

where they have been introduced, agriculture has instantly and sensibly improved. We are aware that in the vicinity of our great towns, where the farmer already enjoys as much encouragement as he can wish, by a ready demand for his productions, these arguments do not apply. But if the introduction of these sheep into the interior will tend, as it has done in Saxony and France, to induce our farmers to raise large quantities of carrots, turnips and potatoes, and to increase the amount of their crops of hay, it will surely be productive of great improvement in our cultivation. We cannot believe that the illiterate and bigotted peasants of France can surpass our farmers in enterprise and industry.

Let us then not despair of the ultimate success of the breed of merino sheep. They may, (as they *have* done) often change owners, till they get into the hands of the intelligent, economical and industrious. The first adventurers may suffer loss, but the country will be ultimately enriched. Already merino wool has been within our knowledge exported to Great Britain without loss, and it would not be more extraordinary than many things which this age of enterprise has witnessed, to see it become one of the staple exports of New England. Entirely disconnected personally with this speculation, I hold in high honour those few independent men, who, not yielding to a rash and unfounded despair, have continued to encourage this unpopular race of animals, with a conviction that their country would be ultimately benefitted, and that a temporary depression would be followed by a just and reasonable estimation of their value.

I have thus endeavoured to shew *very briefly*, if we consider the *extent of the subject*, but *very tediously*, in reference to the *patience* of an audience; (for what writer has the art of knowing to what extent he may safely stretch *that* patience, and at what precise point, disgust and fatigue will commence?) I have endeavoured to shew that

agriculture, like all other arts, is indebted to the enterprise and efforts of men not immediately concerned in it as a source of subsistence, for many of its most important improvements. It would indeed *not* weaken the argument to admit, that many of the experiments of theoretical farmers entirely fail. How long did the alchemists waste their learning and labour, in endeavouring to produce gold where *none was to be found*, and yet to them we owe the present improvements in chemistry, which more than any other science has contributed to the present improved state of the arts. There were more than twenty unsuccessful attempts to apply the well known power of steam to the propelling of vessels, before our Fulton had the glory and good fortune to bring to perfection one of the most important discoveries in the arts.

I have purposely omitted in the enumeration of the benefits which agriculture has derived from science, those to which chemistry has given birth. The subject is too abstract for a mixed audience. But there are few persons who have read the late able and interesting work of Sir Humphrey Davy on Agricultural Chemistry, who do not perceive its intimate connexion with this important art, or who do not feel a prophetic conviction of its future usefulness. This however is a subject with which the practical farmer cannot trouble himself. He would only be confused and bewildered should he attempt it; but there is reasonable ground of hope, that men of leisure and science, (and such the rapid prosperity of our country is constantly producing) will be led to more accurate and philosophical views of agriculture, and that from their experiments, their neighbours will derive great ultimate advantage.

This is the order of nature. When Newton was investigating the laws of the planetary system, the untutored sailor little dreamed, that his efforts were to afford him a safer and more rapid progress over the mountain waves.

We now proceed to the discussion of the second question. Admitting that the efforts of men of leisure and science are promotive of the interests of agriculture, in what manner do your societies, your premiums and your shews, contribute to this end? The first reply we make, is by presenting the example, consent and united opinion of the governments and people of the most enlightened countries. We have no better foundation for our opinions on questions of taste, political economy or morals. The general sentiment of enlightened men in an age of free inquiry, forms as solid a foundation for our conduct as any which we can devise. The first publick society of this description, we believe, was found in Great Britain; whose agriculture, even at the time of its foundation, was in a more improved state, than that of any other European nation, except, perhaps, Flanders. The Bath and West of England Society had the honour of leading the van in this generous attempt to improve and elevate the most important and interesting, as well as most innocent human art. That art which, free from vice, or a tendency to produce it, is productive of none of the injurious effects, from which not many other extensive human arts are wholly exempt. The British nation soon became awakened to the importance and value of such institutions, and by a parliamentary provision, with noble munificence, founded a National Society. The state of Massachusetts had the glory of early appreciating the value of such institutions, and this Society can trace its origin to a period, when those of Europe were still in their infancy. It is this noble emulation in virtue, in efforts to increase the prosperity and happiness of the human race, by increasing and multiplying their comforts, which redounds much more to the honour of human nature, than all the splendid achievements which fill up the black page of history; a page which is little else than the record of human weaknesses, passions and crimes. France, the

jealous rival of Great Britain, but her generous competitor in the arts, soon followed her example, and of her hundred departments, there is scarcely one which does not boast a Society for the promotion of agriculture. Happy would it be for the world, if these two *great gladiators*, whose swords have scarcely been sheathed for a thousand years, who have estimated their glory only by the extent of their butcheries of the human race, would hereafter rival each other only in the arts of peace.

The example of the enlightened nations of Europe has not been lost on the United States, and Agricultural Societies are spreading with a rapidity in our country, which affords the best hopes, that this art will not only hereafter be held in higher honour, and cultivated with the zeal and intelligence which it merits, but that it will supplant those ambitious and dangerous propensities, alike fatal to our repose and our morals. But though this common consent of the enlightened world might be deemed of itself a sufficient proof of the value of such societies, we may not fear to appeal to higher evidence, the principles of the human heart, and the operations of human passions.

Is this the only profession in which men are insensible to public favour, estimation and rewards? It has been till of late years treated by rulers, as if it was an ignoble and degrading employment, and so it was so long as it was exercised only by serfs and slaves. In France, within fifty years, the employment of a farmer was considered a degrading one. But if it is thought to nerve the soldier's, or sailor's arm, or to invigorate their courage, and to induce them to be more prodigal of their own blood, and that of their enemies, to be profuse in our applause and our rewards, our votes of thanks and swords, and triumphs; do you think that the retired and modest cultivator of the earth will feel no pride in seeing his country honour and reward his silent, peaceful, but invaluable labours?

Must we *always* act in direct contradiction to our principles and *best interests*, and place a value on qualities and attainments which are destructive of our welfare, to the utter neglect of those upon which the existence and prosperity of our country depend?

Men, and their feelings and motives, are the same, in whatever situation they may be placed. They may be taught to encourage the ferocious passions or to cultivate the kindly affections. It depends on rulers and on the laws, to give them a virtuous and useful, or vicious and pernicious direction. The plain and too much forgotten and neglected husbandman, contributes *directly* or *indirectly* more than seven-eighths of all that is effected towards the support and prosperity of a state. Indeed their number in our happy country is nearly in that ratio. It cannot be questioned, unless the laws of nature are reversed as to this great mass of society, our chief stay and support, that attentions to their profession, the holding it in deserved respect, the rewarding examples of successful and peculiar industry in individuals, must have an influence on the advancement and progress of the art. The spirit of emulation is as capable of being excited in this art, as in the calamitous, and what we all acknowledge to be the unprofitable one of war. A farmer's breast is as open to generous feelings, is as alive to applause and approbation, and as much chilled by neglect, as that of the proudest spirit which ever wore a sword. Our defence then of these exhibitions and these rewards, rests on the immutable laws which regulate the human heart. If further argument could be necessary, it would be found in the generous and enlightened spirit of the men (most of whom are gone to receive the rewards of virtuous and well spent lives, in a better and happier world) who were the munificent founders of this society in a poorer age, and by whose generous donations we are chiefly enabled to reward the efforts of our industrious and enterprising citizens, and in the continued

marks of individual approbation, recently exhibited in the contributions towards the erection of an edifice, calculated to give accommodation and respectability to this institution. We may be permitted to express a hope, that this patronage is not exhausted, but that we may derive from the public spirit of those who have not yet had the honor to enrol themselves among our benefactors, the means of completing the edifice, which the liberality of others has enabled us to erect.

In a republican government, the best evidence of the utility of any system, or project, must however be drawn from the approbation of the Legislature; and we are happy in having this opportunity of expressing our gratitude to the Commonwealth for its long continued, deliberate, and zealous support and encouragement.

The countenance afforded in past years, and on the present occasion, by the first magistrate of the state, and the other publick functionaries, whom the people have delighted to honour, is not the smallest proof of the high estimation in which agriculture, and all the efforts to promote its extension, are held in this enlightened Commonwealth. Let us then, my friends, upon this occasion and on this subject, upon which there can be no division of sentiment, no unkind and uncharitable feelings, which too often embitter our discussions on other topics, proceed to the innocent and delightful duties of this day, with a cordiality of feeling, which may make some reparation for the pain and distress, which our unhappy divisions on other occasions, and in past times, have too often produced. Let such scenes, often repeated, soften our asperities, and make us feel, that we are truly the children of a common country and a common Parent; and let us now unitedly render our unfeigned thanks to that benevolent Being, to whom we are indebted for all the blessings, which this occasion is designed more particularly to display.

TRUSTEES' ACCOUNT OF THE CATTLE SHOW, AND EXHIBITION OF MANUFACTURES, AT BRIGHTON.

ON Tuesday, the 13th day of October, the Cattle Show commenced at *Brighton*, pursuant to the notice issued by the Trustees of the *Massachusetts Agricultural Society*. The weather on that morning was very unpromising, which prevented many of the citizens of the town, who are afraid of exposing their health, from attending. From all parts of the state, and especially from the neighbouring counties, the attendance was greater than ever before known. The proceedings were opened by prayer by the Rev. Dr. Foster, and the rules, regulations and arrangements, were announced by the President. After which the Committees, for awarding premiums on Live Stock and of Domestic and Household Manufactures, proceeded to the examination of the various and numerous articles presented for premium.

The exhibition of animals offered for premium this year far exceeded that of any former year, both in number and quality. If there was any exception, it was in the article of Milch Cows. Several very fine ones were certainly to be seen, but we indulge the hope of seeing this essential class of animals of a still more improved grade, the *most important*, as the foundation of two of our staple productions, Butter and Cheese, and the *necessary* instruments in the improvement of our breed of cattle.

The first article taken into consideration among the live stock, was the native *Bulls*. There were many fine specimens of this animal—principally, however, almost too young to enable the judges to form a correct opinion of their *future value*. Among those which did not receive a premium, but which were highly deserving of public notice, were those of Mr. Gregory Mason, of Shrewsbury;—the beautiful calf of Nathaniel Chandler, Esq. of Petersham, of a race highly valued, but nearly extinct in the county of Worcester. We have understood with plea-

sure that this six months' calf was sold for sixty dollars, and we hope that the purchaser will cherish and preserve this valuable breed. A fine *Bull* was also exhibited by Asabel Pomeroy, Esq. of Northampton; another by Mr. Eli Forrester; and an excellent but more aged *Bull*, by Mr. Gordon, the owner of the famous Westbrook cattle. We trust the owners of these animals, and all other persons in every class of exhibition, who did not obtain premiums, will recollect that it was impossible that all should obtain rewards; that they have done great credit to themselves and their native state, by contributing to the respectability of the *Show*, and that their turn for premiums may come another year. We indulge the hope, that a higher and nobler wish than that of being the successful competitors had an influence in inducing them to honour the Society and benefit the State, by exhibiting the noble specimens of their care and skill. We return them our thanks. Let them all be persuaded, that we manage our exhibitions, and decide our premiums, with all the impartiality in our power. In the present year, to prevent the possibility of the imputation of prejudice, the trustees only placed a Chairman on each Committee. In all cases a majority of the judges, and in the most important one, that of Live Stock, which was the first object of the Institution, there were four persons out of five selected from the citizens at large.

The Committee on Live Stock were Messrs. J. Lowell, Isaac M'Lellan, Joseph Harrington, Ebenezer Gay, and Abijah White.

The *first* premium for the best native *Bull* was awarded to Gorham Parsons, Esq. of Brighton, 40 dollars.

The *second* do. to Tilly Higgins, of South Berwick, 25 dollars.

The *first* premium for the best *Milch Cow*, to Ebenezer Pope, of Sterling, 40 dollars.

The *second* do. to the great Westbrook Cow, owned by Mr. Gordon, of Westbrook, the parent of the great race of animals exhibited by him, 30 dollars.

The *third* do. for Milch Cows, to S. W. Pomeroy, Esq. of Brighton, 20 dollars.

There were some excellent Cows which attracted the attention of the judges, and merited it, owned by Gen. Gardner, of Brooklyne, Ebenezer Thayer, Esq. of Boston, Messrs. Dudley Hardy, of Brighton, and Luke Fisk, of Waltham.

We cannot introduce the next subject of premium, *Fat Oxen*, without remarking that this exhibition would have been deemed extraordinary at *Smithfield*, *Loves* and *Holkham*, in Great Britain. It is almost beyond belief, that a single year should have furnished in *one* state, when there were two other rival Shows in other parts of it, the same week, oxen actually, and accurately weighed *alive*, of the following weights:—

Great Chapin Ox, now offered for premium,	-	2734
Benjamin Warren's Ox	- - - -	2475
Luke Fisk's, of Waltham,	- - - -	2449
Rufus Marble's, of Sutton, 1st premium,	- -	2389
Luke Fisk's 2d premium,	- - - -	2297
Edward Whitman's, of Stow, 3d do.	- -	2295
Jonas White and Son's,	- - - -	2047
do. do.	- - - -	1936
John Perley's, District of Maine,	- - - -	1825

The premiums were not awarded according to weight only, as will be perceived. The Trustees do not mean to have it understood that *weight* alone shall be considered, but form, fatness, and a disposition to fatten *easily*. Mr. Warren would have had the second premium, but his ox was raised *out* of the state, though *fattened in it*. We beg the attention of the farmers to this distinction. It is not an illiberal one. It is as much as *Massachusetts* can do to encourage her own Agriculture, and she is *bound* to give it the *preference*. Messrs. White's oxen, though smaller, were so well formed, and so well fattened, that they would have had a premium, if Mr. Abijah White, being

one of the judges, had not declined to have them considered.

The first premium for a fat *Ox* was awarded to Mr. Rufus Marble, of Sutton, 50 dollars.

The 2d do. do. to Mr. Luke Fisk, of Waltham, 40 dollars.

The 3d do. do. to Mr. Edward Whitman, of Stow, 30 dollars.

The 1st premium for *Working Cattle* to the Hon. John Welles, of Dorchester, 40 dollars.

The 2d do. to Mr. Asa Rice, 30 dollars.

The 3d do. to Mr. Aaron D. Williams, of Roxbury, 20 dollars.

For the best *Merino Ewes*, six in number, to Gorham Parsons, Esq. of Brighton, 30 dollars.

For the next best do. to John Parkman, Esq. of Brighton, 10 dollars.

For the best *Native Wethers*, to Mr. Andrew Smith, of Rutland, 10 dollars.

For the next best do. to the same person, 5 dollars.

We should be extremely pleased to see more competition in our owners of *Native Sheep*. They need improvement, and coarse wool is more essential than fine, important as the former may be.

For the best *Merino Ram*, to Richard Crowninshield, Esq. of Danvers, 20 dollars.

For the next best do. to Mr. Moses Coleman, Byfield, 10 dollars.

Mr. Parkman's ram was also adjudged a fine animal, though his fleece was not thought quite equal to the two to which the premiums were awarded.

For the best *Boar*, to Charles Vaughan, Esq. of Hallowell, Kennebec county, 15 dollars.

For the next best do. to Mr. Luke Fisk, of Waltham, 5 dollars.

The Hon. Mr. Pickering, of Danvers, exhibited a very fine boar, of the Bedford and native race, and a barrow of the same breed. Mr. Joseph Brown also presented for premium, a boar of very good form.

For the best *Sows*, two in number, to Mr. J. L. Knapp, of Brighton, 10 dollars.

For the best *Pigs*, to Mr. Lincoln Brigham, Cambridge, 10 dollars.

For the next best do. to William Hull, Esq. of Newton, 5 dollars.

For the best imported *Bull* of the Teeswater breed, a noble animal, to Stephen Williams, Esq. of Northborough, 100 dollars.

For the next best do. imported by Colonel Thorndike, well known by the name of *Fill Pail*, to Mr. Aaron Richards, the present possessor, 75 dollars.

The Teeswater bull was imported last fall, from Great Britain, and is a most important addition to our stock.

Fill Pail was presented by Col. Thorndike to the Society. He is of the Flanders' breed, and particularly calculated for raising cattle for the dairy.

The greater amount of premiums on foreign Stock was granted, in consideration of the heavy expense of importation.

—

Brighton, Oct. 14, 1818.

The Committee on Domestic Manufactures, having examined the various articles submitted to them, respectfully report the following award of premiums:—

To Messrs. Shepherd and Jones, of Northampton,	
for the best specimens of fine Broadcloth, the	
first premium of	\$ 30
To the Rock Bottom Company, of Marlborough, the	
second premium for do.	29

To Mr. Payson Williams, of Fitzburg, the first premium for Woollen Cloth of household manufacture, - - - - -	\$12
To Mr. John Hayes, of Saco, the second premium for do. - - - - -	8

Three pieces of Drab Cloth, exhibited by Messrs. Shepherd and Jones, were thought to be as fine and well finished as the best imported cloths of the same description; and all their specimens, consisting of nine pieces, were wholly free, it was observed, from the smell of dye stuffs and oil, which is sometimes perceived in our woollen fabrics.

In deciding the relative merit of the different articles, the Committee did not lose sight of what ought to be the positive merit to entitle any to premiums, in the present advanced state of some branches of manufacture. The Committee, however, are warranted by the exhibition the present year in saying, that the character of our woollen fabrics is now too well established for any ground of fear, that the best which shall be exhibited in any future year will be too poor to deserve a premium. Several of the specimens offered by the unsuccessful candidates were, in the judgment of the Committee, good cloths; and the prices affixed to them so moderate, as to indicate a strong probability of a prevailing competition with those of foreign importation, at no very distant period.

The Committee further report an award of premiums to the following persons:—

To Messrs. Wolcott and Groves, of Southbridge, for a specimen of Cassimere, - - - - -	\$10
To Mr. Payson Williams, of Fitzburg, for a specimen of Flannel of household manufacture, the premium of - - - - -	10
To Mr. Nahum Hardy, of Waltham, for Butter of an extraordinary quality, - - - - -	10
To Mrs. Elizabeth Childs, of Cambridge, for fine specimens of sewing silk of various colours,	

and for articles of silk manufacture from silk-worms raised by herself, the premium of - \$ 5

In this last case it was stated to the Committee, that the expense of providing and preparing the raw material and manufacturing a pound of sewing silk, did not exceed that of a pound of common brown thread.

Several articles were exhibited for which no specific premiums had been offered. But as they evince a laudable spirit of enterprise and industry and are useful fabrics and of household manufacture, the Committee take the liberty to exercise a discretion in recommending the following premiums, viz. :—

To Miss Bourne, of Kennebunk, for a Cotton Counterpane, - - - - -	\$ 8
To Miss Olive Temple, of West Boylston, for do.	8
To Mrs. Judith Sargent for a pair of fine Woollen Hose, - - - - -	5
To Miss Mary H. Leach, of Salem, for a specimen of silk Buttons, - - - - -	5
To Miss Susannah Bass, of Quincy, for a Carpet,	5
To Miss Lyman for a specimen of Gloves, -	3
To Mr. Lewis Nason, for extra fine Straw Bonnets,	10
To Mr. John Kennedy, of Seconk, for Damask Table Cloths, - - - - -	5
To Mr. James Watson, of Attleborough, for specimens of Bedticking, - - - - -	10
To Mrs. Richard Crowninshield, of Danvers, for several specimens of Linen Thread, - - -	5

A Lace Veil was shewn, from the factory of Mr. Francis White and Charles Davis, Esq. at Watertown. The establishment of Messrs. White and Davis is recent, and promises from the fineness and beauty of the specimen exhibited, to deserve the future countenance of this Society.

Several extra fine Beaver Hats were exhibited, by Mr. Guerin from his manufactory at South Boston.

The Trustees must have noticed with pleasure the specimens of elegant cut Flint Glass, exhibited by the New England Glass Company at the Society's Hall. It was stated, that the exports of this article had already been large for the time the works have been in operation. And thus while they administer to the luxury of persons beyond the limits of the state, they afford a profitable employment of capital, and give support to an ingenious and industrious class of labourers, who, being foreigners, add the profits of their ingenuity and skill to the common stock of wealth in this community. Fifty persons are now employed in the various branches of this business, and the capital vested is forty thousand dollars.

The growing prosperity of the several branches of manufactures which may be considered as established, particularly that of cotton, now placed on a secure foundation by the admirable machinery invented and perfected by the Boston Manufacturing Company at Waltham, and the increasing subdivision of labour observable in mechanic employments in all parts of the community, will authorize us to consider our country as now enjoying many of those advantages pointed out by a great practical statesman, as annexed to a flourishing state of domestic manufactures. Among which may be enumerated

The additional employment afforded to classes of the community, who have leisure from their other and ordinary occupations.

The furnishing greater scope for the diversity of talents and dispositions existing among men.

The affording a more ample and various field for enterprise.

The creating in some instances a new, and securing in all, a more certain and steady demand for the surplus produce of the soil.

An extension of the use of machinery ; and lastly,

The employment of persons who would otherwise be idle, either from the bias of temper, infirmity of body, or some other cause, indisposing or disqualifying them for the toils of husbandry.

RICHARD SULLIVAN, }
 WILLIAM LAWRENCE. } *Committee.*



The Committee consisting of Gorham Parsons, of Brighton, Jonas White, of Watertown, Esquires, and Mr. Isaac Davis, of Roxbury, to whom was referred the Ploughing Match, have attended that business, and ask leave to report, That in consequence of bad weather, the 14th, the work was postponed to this day, the 15th. When they repaired to a piece of ground belonging to Mr. Parsons, which had been previously surveyed into twelve lots of one quarter of an acre each. But on examining the book of entries produced by Mr. Winship, it was found, that only seven of the nine competitors had appeared on the ground, and subscribed the rules and regulations as directed by the Trustees. The seven competitors drew for a choice of lots, when it was found,

That No. 1 was drawn by Samuel Ward, of Roxbury; his team one yoke of oxen, his ploughman Samuel Clarke, and no driver. Work performed in 47 minutes, 33 seconds. Plough made by Jesse Warren of Dedham.

No. 2 by Timothy Cosey, of Brooklyne; his team two yoke of oxen, ploughman Timothy Cosey, driver Alfred Snell. Work performed in 35 seconds, 45 seconds. Plough made by Bigelow of Weston.

No. 3 by Samuel Ward, of Roxbury; his team two yoke of oxen, ploughman Ezekiel Colburn, driver Nathaniel Ham. Work performed in 41 minutes, 30 seconds. Plough made by Jesse Warren in Dedham.

No. 4 by Ebenezer Stedman, of Cambridge; his team one yoke of oxen, driver Samuel Stedman. Work per-

formed in 62 minutes, with the aid of an additional yoke of oxen the last 10 minutes. Plough made by Washburn and Bramin.

No. 5 by Joseph Curtis, of Roxbury; his team two yoke of oxen, Thomas Blake ploughman, driver George Boyden. Work performed in 40 minutes, 30 seconds. Plough made by Jesse Warren of Dedham.

No. 6 by John Prince, Esq. of Roxbury; his team two yoke of oxen, ploughman Thomas James, driver ——— Work performed in 34 minutes, 50 seconds.

No. 7 by Aaron Davis Williams; two yoke of oxen, ploughman Thomas Howe, driver Daniel Howe. Work performed in 39 minutes, 30 seconds. Plough made by Jesse Warren of Dedham.

Your Committee regret they had not a premium to award every competitor, for *all* ploughed well, and deserve some mark of public approbation; but being under the necessity of selecting those which, in their opinion, have the strongest claim to the premiums offered by the Trustees, in their decision they ask your confidence, they request your approbation, for they have endeavoured to deserve it, and award as follows:—

To Capt. Joseph Curtis, first premium, plough,	\$ 20
Thomas Blake, ploughman, - - -	10
George Boyden, driver, - - -	5
	———\$ 35
To Samuel Ward, second premium, plough,	\$12
Samuel Clark, ploughman, - - -	6
Samuel Clark, who had no driver, - - -	3
	———\$ 21

Your Committee beg leave to observe, that in giving Mr. Ward the second premium, they would not have it understood they approve the mode of turning sward land with one yoke of cattle, and without a driver; they consider it injudicious, and not the mode in which the best farmers do their work, when they wish most to economise; and the

farmer who practices it cannot be considered as merciful to his beasts. But it is awarded on the principle on which the premium was given out, and the decision approbated the last season in a like case.

For the third premium they found three competitors who had very strong claims to it, Mr. A. D. Williams, Mr. Timothy Cosey, and John Prince, Esq. They were much at a loss how to decide; they despair of satisfying the public, for they could not satisfy themselves; but compelled to award the premium, they have with great difficulty on their minds awarded to Aaron Davis Williams, of Roxbury.

Plough, - - - - -	\$ 12
Thomas Howe, ploughman, - - - - -	4
David Howe, driver, - - - - -	2
	—\$18

All which is respectfully submitted,

GORHAM PARSONS, *Per Order.*



Report of the Committee on Agricultural Experiments, made to the Trustees, at their stated meeting on Saturday, Dec. 26, 1818.

The Committee decide that Capt. David Little of Newbury, in the county of Essex, is entitled to the premium of thirty dollars, for having raised the greatest quantity of carrots on one acre of ground; and that Mr. Payson Williams of Fitchburg, in the county of Worcester, is entitled to the premium of thirty dollars, for the greatest crop of potatoes.

For the premium on carrots there were three competitors, all of whom had very large crops. Mr. Little, Mr. John Pierce of Dorchester, in Norfolk county, and Mr. John Parkman of Brighton, in Middlesex. Supposing each bushel to weigh 56 pounds, Mr. Little had 378 bushels, Mr. Pierce 820, and Mr. Parkman 650; yielding on an average more than 19 tons to an acre. The modes of cul-

ture were much the same in the three cases, excepting that Mr. Little made use of a drill in sowing which lessened the expense greatly; and he used more manure, by a third part, than the others. Putting all the charges together, Mr. Little expended a less sum than either of the other two, yet his crop was the largest by nearly three tons. His account of the manner and expense of cultivation, stated by himself so plainly as to be easily understood by every farmer, will be annexed to this report.

For the premium on potatoes, Mr. Williams had no competitor. Had his crop therefore been a poor one, he must have had the premium. It was 438 bushels, which may be considered a good crop.

It will be seen by Mr. Williams's account, which is annexed, that one part of his acre was planted in trenches, and the other in hills, and that the result was rather in favour of hill-planting, which is the more common method. Having used *new* manure on one part, and *old* on another, he found the crop much better where the *new* was placed. This also is in conformity with the prevailing opinion. But although the experiments of Mr. Williams, as to trench planting and old manure, seem to prove the usual way of raising potatoes to be the best (and if so, it ought to be continued) yet all such trials have their uses; and we ought to feel obliged to any one who will be at the pains to make them.

The Committee regret, that there were no more claimants under the head of Agricultural Experiments. One reason may have been, that for many articles the season was unfavourable. Owing to a cold and very wet spring, and to its having been very dry from the latter part of July, the crops of wheat and other grains were uncommonly light. From about the 24th of July to the 7th of September, forty-five days, there was little or no rain, at least in this vicinity; and the consequence was, that potatoes and turnips fell far below the usual quantity. Carrots

yielded very plentifully, notwithstanding the want of rain; and it may not be amiss to notice this as proof of its being a more certain crop than some other vegetables. But though the exhibitions made to the Committee this year, from whatever causes, have been few, the Committee are gratified in being able to state, that it is becoming a common thing among provident farmers to attend to the raising of roots, in considerable quantities, as winter food for cattle. Several instances have come within their knowledge, this season, in all of which the amount of the produce has been very encouraging, though generally on pieces of less than an acre. When it is considered that an acre of carrots, potatoes or turnips, will, in a common season and with no uncommon care, yield five or six times the weight of food for cattle, that an acre of grass land will produce, and of food as nutritious as hay, and of which cattle are quite as fond, this alone would seem a sufficient inducement to our farmers to go into this kind of culture on a larger scale. In England the importance of cultivating roots, as food for animals, is so well understood, that though grass must be a principal object always with farmers, yet few or none omit to raise large quantities of vegetables. A man would hardly be called a good farmer, who did not provide for his cattle in this way. It should be considered too, how much better our stock would be, and of course, how much more useful and profitable, by feeding them on a variety of food, instead of being confined during our long winters of six months, to dry hay. Those who have followed this method in feeding their milch cows, oxen, horses and sheep, need nothing said to convince them of the truth of this remark; as a further inducement it may be observed, that our crops of hay often fall short—so much so, sometimes, as to force the owners of cattle to sell them at a loss, or kill them, for want of food. The same season which may prove unfavourable for grass crops, may not, and very probably will not, be so for carrots and many other vegetables; and

what an excellent resort would they afford in such cases ? The Committee may be allowed to dwell a little on this subject, as it has become a common opinion, that even our best agriculturalists have erred greatly in this respect, and that it would be a prodigious improvement in our husbandry, if it was made a rule to raise every year a large quantity of roots for the express purpose of feeding cattle, instead of confining them so exclusively to hay as is now the practice.

No claim was made this year for the premium on wheat. Some persons, perhaps, who had good crops of this article, were prevented from becoming candidates from a belief, that others might have had better. After the premiums were paid out and published last year, some of the Trustees were told, that in the District of Maine, there were many crops of wheat which far exceeded the one in Shrewsbury, of thirty-five bushels to the acre, on which the premium was given. It would have been, and still will be, gratifying to the Trustees to award some of the premiums to farmers of that interesting and valuable section of the state ; and it is hoped, that another year will bring forward candidates from that quarter. In the articles of wheat and potatoes, at least, they need not fear to come in competition with any part of the Commonwealth.

With respect to some of the objects to which the public attention is called, under the head of agricultural experiments, it must not be expected, that our practical farmers, generally, will contend for them at present. What has been almost wholly untried or requires uncommon care, should first be attempted and proved profitable and well suited to the climate, or otherwise, by the few who can best afford, and ought not to regard, the necessary time and expense. It is in this way, that valuable improvements have been introduced into other countries ; and it ought to be so in ours, which affords a field so ample. All classes of agriculturalists, theoretical and practical, as they

regard a most important interest, are called upon to afford all the aid in their power towards meliorating the agriculture of our country. Much remains to be done. Vain will it be to have societies for the promotion of such objects, unless ingenious, enterprising, and industrious individuals, throughout the state, will join their efforts and communicate the result of their exertions. It is no mean pursuit. "The true objects of the agriculturalist are likewise those of the patriot. Men value most what they have gained with effort; a just confidence in their own powers results from success; they love their country better, because they have seen it improved by their own talents and industry; and they identify with their interests, the existence of those institutions which have afforded them security, independence, and the multiplied enjoyments of civilized life."*

P. C. BROOKS, *Chairman.*

Newbury, Nov. 23th, 1818.

[To the Trustees of the Massachusetts Agricultural Society.]

GENTLEMEN,

Agreeably to your directions, I hereby undertake to state to you the quality of the land, on which I raised carrots the present year, and on account of which, I have in due season put in my claim for the premium, having obtained a certificate for its entry, &c. About one third of the land is situate on a gentle swell, and is a pretty deep yellowish loam; the other two-thirds falls off southwesterly, and is level, or rather flat land, and is a deep black loam, and not very stiff. The quantity of manure and amount of produce I cannot accurately state, but believe there were about from fifteen to twenty common cart loads of yard manure put on the land, and ploughed in, cultivated principally as a garden, with onions, carrots, beets, and potatoes, in the year 1817. The quantity of manure the present year was seventeen common cart loads, ploughed in;

* Sir H. Davy.

the quantity of seed used for the carrots the present year, was one pound; but half that quantity would have been sufficient. The time of sowing my carrots was the 9th day of May; the manner of sowing was as follows:—After the ground was prepared, I marked out the rows fourteen inches wide with a marking rake, and rooled a machine (made for the purpose) with two wheels and two hoppers in two of the rows at once, dropping the seed at suitable distance as it passed. I commenced weeding the 2d day of June, hoeing between the rows with a common hoe, and plucking weeds with fingers between the carrots. About one third part of the work was performed by children through the season, and I worked when it was most convenient; and after weeding them three times over, and calculating the time really spent, I found it equal to twenty-four or five days work for one man. The harvesting was commenced the 26th of October and ended the 12th of November; the mannner of harvesting was by running a plough near the row, and the carrots were thrown out with a clam digger; the whole time spent in harvesting was about fifteen days for one man. The whole amount of produce was nine hundred and sixty one bushels of carrots, and where the seed did not come up, or was destroyed by insects, about two bushels of beets were raised, and fifty-one cabbage heads, together with a great number of cabbage plants which were sown with the carrot seed, and yet I think there was as much as four or five rods of land remaining, where nothing grew for want of seed; and after all there were fifty apple and pear trees set in the spring of 1817, two other apple trees whose branches extended one rod and an half, four others, whose branches extended about ten feet each, the damage of the above trees, together with a row of apple trees standing near, and on the south side of my carrot bed, in my estimation was equal to fifty bushels of carrots at least.

DAVID LITTLE, { *Owner.*
STEPHEN LITTLE, { *Assistant.*

N. B. Our common carts hold about forty bushels; the black loam land was most productive.

1818.

EXPENSE.

Seventeen loads of manure, equal to	-	-	\$ 29 50
April 25th and May 2d, two ploughings,	-	-	6
Three harrowings,	-	-	1
Two men half a day raking the ground,	-	-	1
One day markind rows and raking in seed	-	-	1
One pound of seed,	-	-	1
Four hours sowing seed,	-	-	50
June 2d to September, weeding the carrots,	-	-	24 50
Oct. 26th to Nov. 12th, fifteen days labour har-	-	-	15
vesting,	-	-	
			<hr/>
			\$ 79 50

1818.—*Essex, ss. Nov. 26th.* Then the within named David Little and Stephen Little, personally appeared and made oath to the truth of the within statement before me.

SILAS LITTLE, *Justice of the Peace.*

Essex, ss. Nov. 26th, 1818. Then personally appeared Tristram Little, and was sworn to the faithful discharge of the duty of surveyor of lands before me.

SILAS LITTLE, *Justice of the Peace.*

These certify that the foregoing carrot bed, on which Mr. David Little has put in his claim and received a certificate for the premium, contains one acre precisely.

TRISTRAM LITTLE, *Surveyor.*

One acre of potatoes, as measured by Philip F. Cowdin, were planted the first of June, part in trenches and part in

hills three and an half feet apart, the quantity of seed, thirty-six bushels planted whole; say those in the trenches thirteen inches (or thereabouts) apart, the size of a goose egg, and two in the hill of a similar size—were hoed the first time about the 25th of June; the second and last time about the 15th of July—were dug between the 18th and 24th of October, and were by actual measurement four hundred and ninety-eight bushels and an half. The manure used was twenty-two cart loads; one half winter or raw, the other summer or rotten; the former yielding more in quantity and better in quality than the latter, being entirely free from the attack of the wire worm. The product of the hill and trenches in bushels nearly equal on the same space of ground; the potatoe in the hill, however, was of a larger size. The ground on which the above potatoes were raised, was what is generally termed old field, and was sowed the year preceding with spring rye, without manure.

PAYSON WILLIAMS.

AARON BOLTON.

Worcester, ss. October 24th, 1818. Personally appeared Payson Williams and Aaron Bolton, and made oath, that the above statement by them subscribed, contains the truth and nothing but the truth, before me.

CALVIN WILLARD, *Justice of the Peace.*

The Committee, consisting of E. Hersy Derby, General Gardner, and Nathaniel R. Whitney, Esq. to whom were referred the trial of Working Oxen, beg leave to report as follows:—

That seven pair were entered for trial. Two waggons, weighing 14 cwt. 2 qrs. each, loaded with stone, and weighed in Mr. Dearborn's platform balance, were made to weigh 49 cwt. 2 qrs. each, including the waggon, and were drawn each by a yoke of oxen from the division of the

road near Mr. Winship's up the hill as far as the tavern. Here a trial of their skill in backing the loads was made, and the teams returned to the division of the road.

Your Committee took into consideration, not only the strength of the oxen, but also their age, size, equality of match, and any other general circumstances.

All the oxen were so good, and performed so entirely to the satisfaction of the judges, that they found it extremely difficult to decide; but after a great deal of consideration have awarded as follows:—

The first premium of forty dollars to Hon. John Welles, of Dorchester.

Second do. of thirty dollars to Asa Rice, of Worcester.

Third do. of twenty dollars to Aaron D. Williams, of Roxbury.

All which is submitted by order of the Committee.

E. HERSY DERBY, *Chairman.*

Brighton, 16th Oct. 1818.



COMMITTEE ON INVENTIONS.

Your Committee for the inspection of Inventions, have attended that duty, and beg leave to report:

That only two threshing machines, and one plough were offered for premium.

The threshing machines belonged, one to Mr. Elihu Hochkiss, of Brattleborough; and the other to Messrs. Gay and Bullard, of Dedham. The plough was presented by Mr. Jesse Warren, of Dedham.

Your Committee, after hearing the evidence as to the power of these machines, and the expense requisite in working them; and after having examined them and seen them worked, are of opinion, that the one belonging to Mr. Hochkiss is the most simple, and least expensive machine of the two, and easier transported from place to place. They also consider that this machine, from its construction,

is least liable to get out of order ; but they are sorry to find, that neither of the machines are calculated to thresh mixed or mowed grains, as they require that the heads of the rye or wheat should be presented first to the roller. They are however compelled, under your rules, to award the premium to Mr. Hochkiss, in consideration of the properties in his machine before stated, as well as because they think his machine threshes wheat and rye more thoroughly than the other ; and your Committee are of opinion, that if this machine could be so altered as to thresh mixed or mowed grain, it would be highly deserving general attention among the farmers of this state, both on the seaboard and elsewhere.

Your Committee recommend, therefore, that the premium of 75 dollars be paid to Mr. Hochkiss.

Your Committee are of opinion, that the plough offered by Mr. Warren contains nothing new, except the cutter, which is good only on land clear of stones, and because said cutter is not the invention of said Warren. They have, therefore, given him no premium.

SAMUEL G. PERKINS, *Chairman.*

West Springfield, 9th April, 1818.

MY DEAR SIR,

THE communication which I made you in November last, respecting my potatoe crop, was not of such a nature as to require any apology for neglect, even if that had taken place, nor did I consider it as entitled to the flattering notice you feel disposed to give it. The crop was unusually large, but not attributable to any thing new in the mode of cultivation or to any exertions of the cultivator. If, however, you think any part of the communication worthy of publication, you are at liberty to extract such part of it as you please, and give it publicity.

In answer to your enquiry "whether there was any thing peculiar in my soil, which should occasion so extraordinary a result?" I do not know that there was. Nor do I know of any cause to which I can attribute my success in this instance, and by which I could regulate my practice so as to produce a similar result upon another trial.

The ground was a rich loam, situated upon the eastern declivity of a hill of gentle ascent, and was undoubtedly enriched and enlivened from the annual fall of the leaves from the neighbouring wood. As the bushes and briars were mown off in August 1815, and as the crop of 1816, owing to the extreme cold and drought of the season, was light and did not exhaust or impoverish the soil, it was in effect new land. In the spring of 1817 it ploughed up very mellow and lively.

I have, in two former instances, had an unusually large crop of potatoes, though no measures were taken to ascertain the quantity. They were the second year's crop from turf land which I had ploughed, manured and planted two years successively.

With regard to the quantity of manure put upon the ground, it is impossible for me to state with precision. No expectation of an extraordinary crop was excited, and no reference was had to any experiment. The principal object in view was to put the land in a suitable state to lay down for mowing. My usual practice is to plant no more ground than can be well manured; generally, at about the rate of twenty loads to the acre. And it is probable that this was about the quantity used in this instance.

The principal part, if not the whole of the manure was taken from my sheep pens. These are littered with straw through the winter as often as is necessary to give the sheep a clean bed, and save their wool from filth.

I have no copy of the letter which I formerly wrote you upon this subject, but I think that I then stated the mode

in which I apply manure on planting ground. So far as I can judge from my own experience, and from my observations on the practice of others, I consider this mode of application preferable to any other.

The aspect of the ground, the condition of the soil, the kind of manure, and the manner of using it, were each of them favorable for a good crop. But they by no means satisfactorily account for the result. These, however, so far as it depended on human choice and human exertions, were the principal causes to which I have been led to ascribe it.

After gathering my potatoes, I sowed one acre of the ground with wheat. It looked well at the commencement of winter, and, I think, is not killed by the frost. But it was sown too late to expect a large crop.

If at any time, it should be in my power to contribute any thing to the stock of agricultural information, or to the encouragement of gentlemen who are devoting their time and talents to the promotion of the vital interests of the Commonwealth, it would prove a source of real gratification. But my situation and pursuits do not admit of my bestowing so much attention to this subject, as to enable me to become a very useful correspondent.

I am, Sir, with the highest esteem,

Your friend, &c.

SAMUEL LATHROP.

West Springfield, Nov. 15th, 1817.

HON. JOSIAH QUINCY,

DEAR SIR,

IN the summer of 1815, I purchased a lot of land, about three acres of which lay upon the side of a hill facing to the east. The upper part was very steep and set to wood. The lower part was of gentle ascent, and had been neglected by the former proprietor as unworthy of attention, ex-

cept for occasional feeding among the bushes and briars with which it was overrun. For some distance below the wood, the ground was full of springs, which rendered the land so wet, that it was unfit for cultivation, and some of the springs were so large as to overflow the land quite to the foot of the hill. At the time of my purchase, I had this part of the lot in view, together with a piece of swampy land, as susceptible of the greatest improvement.

My first object was to cut off the springs, which was, in a good degree accomplished, by opening a drain across the lot, a little below the head of the springs. In the latter part of August, the bushes and briars were all cut, and in the spring of 1816 the ground was ploughed for a crop of potatoes. After ploughing, a coat of manure was spread upon the ground, and harrowed in as well as could be done, considering the nature of the ground and the kind of manure that was used. But owing to the extreme cold and drought of that season, the potatoes having been planted rather late, the crop was light. Last spring, I had the ground ploughed in good season, spread on a heavy coat of manure, then ridged it up by turning two shallow furrows together, and planted the potatoes on the ridges. The rows were about three feet asunder, and the hills at about the same distance in the row. The quantity of land planted, was one acre and sixty rods, and the produce was 850 bushels.

As my drain did not entirely cut off the springs, a part of the ground continued so wet, that it produced but little, and still further down, the crop was injured by the shade of the woods. Take one acre across the lower part of the piece, and the produce was not less than 700 bushels.

The manure which I used, and which I uniformly select for my potatoe ground, was taken from my sheep pens. These are kept well littered during the winter. There is sufficient nutriment in it to give immediate vigour to the plants. The strawy parts keep the ground loose during

the early part of the season, and as they decompose, continue to afford fresh food and nourishment for the plants. I have had better success in raising potatoes with this kind of manure, than with any other, or than with that which was well rotted.

By ridging the land, the principal part of the manure is brought upon the ridge, and slightly covered with earth. After making the hole for the reception of the seed, a single stroke of the hoe will bring a portion of the manure into the hole, and if the seed is covered by walking in a contrary direction from that in which the holes were made, a sufficient quantity of manure, mixed with earth, will be laid upon the seed. As I hoe potatoes but twice, in both instances I plough towards the hill, though, where the ground will admit of it, in transverse directions. In this mode, the crop derives a greater benefit from the manure, than if it was spread upon the ground before ploughing. Where the latter practice is followed, a part of the manure is buried so deep, that much of its virtue is washed below the reach of the plough, and below the roots of the plants, and is therefore in a great measure lost. For many years I have uniformly put on my manure after ploughing, both for corn and potatoes.

I am, Sir, with the highest respect,
Your very obed't servant.

SAMUEL LATHROP.

Brewster, Nov. 10th, 1818.

DEAR SIR,

WITH the most cordial thanks for your friendly communications respecting the culture of wheat, I now forward to you the result of an experiment which I was earnestly desirous of making, for the benefit of this section of our country.

You may recollect, Sir, that the season was so far advanced before I applied for the seed, and could obtain it at this distance, that it was deemed extremely hazardous, and almost chimerical to attempt the growth of it the present year. But having a piece of land, as I conceived, well adapted, and suitably prepared, which I was about to lay down to grass, and unwilling to lose the present opportunity, the wheat was sown, though with little prospect of success, April 25th, and reapt August 1st, completely fit for the harvest.

Had I received the seed much sooner, the land could not have been prepared earlier, for its reception, through an abundance of rain; the soil being stiff and heavy, and partly of a clayey loam, and lying in the form of a gradual rise and swell, succeeded by correspondent vales, which were long covered with water.

Of this land a half acre lacking 5 rods was set off by admeasurement for the wheat. From three pecks of seed, after soaking 24 hours in weak brine, and being repeatedly stirred, two quarts of chaff and foul seed were taken, the residue, after being rolled in lime, was sown on the above land.

Late as was the season of sowing, such a quantity of rain subsequently fell, as to cover a quarter part with water, so long, as actually to drown the seed, leaving not more than three eighths of an acre on which the seed took.

From this three eighths of an acre a crop was taken yielding by admeasurement eight bushels three and a half pecks, of good sound wheat, perfectly free from any appearance of blast or smut. Such it has been pronounced to be, by several good farmers who have seen it.

Had it not been considerably tangled by some hens, and a portion of it trampled down near some cherry trees, I presume the produce would not have been less than nine bushels.

The success of the experiment I presume will gratify you; and that gratification will probably be augmented by the assurance that several have applied to me for seed, with a determination to attempt the culture of wheat the following season. That you may receive a similar gratification from your various attempts to promote agricultural improvement, is the fervent wish of

Your obliged friend,
J. SIMPKINS.

N. B. Two crops of Indian Corn had been taken the two preceeding years from the land, at which time it was dunged in hills, and the present season had a light covering of barn and compost manure. But the parts most plentifully manured were those where, by reason of water, the seed failed.

John Lowell, Esq.
Corresponding Sec'y Mass. Agric. Soc.

Salem, Jan. 1st, 1819.

[To J. Lowell, Esq. Corresponding Secretary.]

DEAR SIR,

IN compliance with your request, I send you an account of two crops of Carrots raised in my neighbourhood, the last season.

One by Mr. Erastus Ware, to whom the premium for Carrots was awarded the last year, was on 138 rods of land; the soil a good deep loam, and the third year in succession that one half of it has been appropriated to the culture of Carrots. Five cords of fine compost manure, being about one quarter night soil, was spread evenly on the ground, and being beat down by the frequent rains, was ploughed deep four times, harrowed and pulverised as

fine as possible. The seed was sown the 25th May, in rows fourteen inches apart, by a very simple drill machine. They were three times weeded, and dug early in November, and weighed at the hay scales 44576 pounds, equal to 51682 pounds, or 23 tons, 1 cwt. 1 qr. 22 lbs. the acre. Value of an acre 51682 pounds or 923 bushels of 56 lbs. at 35 cts. \$323 05.

The other by Mr. Ebenezer Thrasher, on 148 rods of land sloping to the south west, part of it light, and part a deep soil; cultivated with carrots, beets, and radishes the preceding year. Twelve cords of manure, horse dung and night soil mixed, were evenly spread, and the land three times ploughed.

Was sowed on the 18th and 25th May, with carrot and radish seed mixed, in rows of fifteen inches apart, weeded five times during their growth, and dug the last of October and beginning of November.

During the season, radishes amounting to \$73 73 cts. were sold from the piece.

18 horse cart loads of carrots weighed at the hay scales
23814 lbs.

227 bushels sold by measure equal to 12712

36526

equal to 39487 lbs. or 17 tons 13 cwt. 2 qrs. the acre.

Value of an acre 39487 lbs. or 707 bushels of 56 lbs. at
35 cts. 247 45

Radishes in the same proportion 79 70

\$327 15

Mr. Thrasher's carrots were uncommonly large.

Yours, with great respect,

E. HERSY DERBY.

ON THE PREPARATION OF FLAX AND HEMP WITHOUT STEEPING.

[From the Repertory of Arts, Vol. 31.]

ACCORDING to the census of 1810, 1,090,320 yards of flaxen cloth, and 60 yards of tow cloth were manufactured in one year in the State of Massachusetts. Hemp, of which 6000 tons were raised in a year in Kentucky, has been cultivated with success and profit on the interval lands of Connecticut river at Springfield and elsewhere. If the culture of these commodities has been progressive, which we have no reason to doubt, nor that it will continue so, it may be presumed that a respectable number of the farmers in Massachusetts have a direct interest in the information which the following paper discloses. No description is given, at full length, of the machines used in preparing the flax and hemp, but if the mind is satisfied that the process pointed out is preferable to water-rotting, the mechanical ingenuity of our countrymen will soon supply all that may be wanting to put them in full possession of the benefits of the discovery. The account, from *Les Archives Philosophiques* &c. of a similar process used in France, will be found interesting, and taken in connexion with that of the English, gives us the important fact, that the result of a simultaneous investigation of the subject in both countries, under authority of the respective governments, was a decided preference and recommendation of the new method over that by water steeping or dew rotting. A short abstract of the different statements would have afforded all that was substantially important to be known by us in this country, but we thought it might not be wholly useless to show the manner in which the investigation was conducted in England

ENGLISH ACCOUNT OF MR. LEE'S INVENTION OF A NEW
MODE OF MANUFACTURING HEMP AND FLAX, PUBLISHED
IN 1815.

About two years ago Mr. Lee took out a patent for obtaining hemp and flax directly from the plant, by a new method. He has established a manufactory for the purpose near London, where his method and the result of it may be seen. Mr. Lee's invention is considered the greatest improvement ever introduced into the linen business, and is likely to occasion a total change in the whole of our bleach-fields. Hitherto the only way of obtaining hemp and flax has been to steep the plants in water till they begin to rot. They are then exposed for some days to the sun, spread out upon the grass, after which the woody part, now become very brittle, is removed by the flax mill, the nature of which is too well known to require description. By these processes the fibres of the flax are weakened, and a considerable portion of them is altogether destroyed and lost. The flax too, acquires a greenish yellow colour, and it is well known that an expensive and tedious bleaching process is necessary to render it white. Mr. Lee neither steeps his flax nor spreads it on the grass. When the plant is ripe it is pulled in the usual way. It is then threshed by placing it between two grooved wooden beams, shod with iron. One of these is fixed, the other is suspended on hinges, and is made to infringe with some force on the fixed beam; the grooves in the one beam corresponding with the flutes in the other. By a mechanical contrivance, almost exactly similar, the woody matter is beaten off, and the fibres of flax left. By passing these through hackles, varying progressively in fineness, the flax is very speedily dressed and rendered proper for the use for which it is intended. The advantages of this method are manifold. The expense of steeping and spreading is saved; a much greater produce of flax is obtained; and it

is much stronger; the fibres may be divided into much finer fibres, so as to obtain at once, and in any quantity, flax fine enough for the manufacture of lace. But the greatest advantage of all remains yet to be stated. Flax, manufactured in this manner, requires only to be washed in pure water, in order to become white. The colouring matter is not chemically combined with the fibre, and therefore is removed at once by water. It is the steeping the flax and hemp which unites the colouring matter with the fibres, and renders the subsequent bleaching process necessary. Thus by Mr. Lee's process flax and hemp are obtained in much greater quantity, of much stronger quality, and much finer in the fibre, than by the common method, and the necessity of bleaching is altogether superseded. The great importance of such an improvement must be obvious to every one.

REPORT OF THE COMMITTEE OF THE HOUSE OF COMMONS ON PETITIONS RELATING TO MACHINERY FOR MANUFACTURING FLAX, MAY 23d, 1817.

The Committee to whom the Petition of Samuel Hill and William Bundy, and also the petition of James Lee, were referred, to report the same, with their observations thereupon to the House, have examined several witnesses in support of the allegations of said petition, and agree upon the following Report.

The Committee proceed to take into consideration the petition of Messrs. Hill and Bundy, on their improved method of preparing flax and hemp, in a dry state, from the stem, without undergoing the former process of water-steeping or dew rotting. Your committee received satisfactory proof, that the preparing flax and hemp, in a dry state, for spinning, answered most completely, and was likely to prove a great and valuable improvement, both to the grower and the manufacturer; the cost of preparing

being less ; avoiding the risk of steeping, which is considerable ; a great saving also in time and materials. It was proved also to your committee that the strength and quality of cloth manufactured from flax thus prepared, are much superior to that produced from flax, which has been water steeped or dew rotted. Your committee are fully impressed with the great national advantages likely to result from this discovery, by which it would appear, that a saving in the proportion of ninety to thirty-three would be obtained on the annual growth of flax in the empire, computed at 120,000 acres, affording an increase of employment to many thousands, and an augmentation of the national wealth, to the amount of many millions, as will more fully appear by reference to the evidence in corroboration of the allegations set forth by the said petitioners.

It appeared also in evidence before your committee, that the flax prepared by Messrs. Hill and Bundy's machines was superior to any dew-rotted flax ; and that large orders had already been given for flax thus prepared, by the house of Messrs. Benyon, & Co. at Leeds, one of the most considerable manufacturers of Flax in the kingdom.

Your committee proceeded to the consideration of the petition of James Lee. Evidence on the part of Mr. Lee was produced to shew that Mr. Lee's machines were in use in various workhouses, in different parts of the kingdom ; that Mr. Lee's manner of preparing flax was without water-steeping or dew-rotting ; and affords additional proof of the great advantages of the practice.

Your committee must also call the attention of the House to the essential benefit that will be derived to the cultivators of flax, from the quantity of valuable food for cattle, obtained from the new method of preparing flax. It has given proof, that the boon or outer coat of flax, contains one sixth of the gluten of oats.

MR. JOHN MILLINGTON'S EVIDENCE.

What are you? I am professor of mechanics at the Royal Institution.

Have you seen Messrs. Hill & Bundy's machine at work, preparing flax and hemp for the spinner? I have.

What is your opinion of the effects produced by the breakers in the first process?

It seems to answer the purpose of taking off the boon or woody part from the flax: I observed that this was pretty effectually done by once passing through the machine, which consists of five rollers. I accurately weighed myself, (first adjusting the scales, and seeing that they were correct) one avoirdupois pound of the stem or flax in its dry state, as it comes from the farm; it required five minutes to pass this through the machine, but I took care not to let the man know that I was timing him, lest he should make an extraordinary exertion, and he seemed to be working at the ordinary rate which he could continue to work for a length of time. I found, upon weighing the product when it came from the machine, there was a loss of nine ounces and three eighths; consequently six ounces and five eighths of useable materials were obtained, that is, of fibre or harl, as it is called generally.

It was then passed through the second machine, called the rubber, or rubbing machine; this required eight minutes for the quantity which was left: the result of this was four ounces and a quarter of harl or fibre in a clean state, fit for the hackie; some gentlemen present observed, that it was scarcely clean enough, and it was passed through a second time; we divided the quantity into two equal parts, and the second process took three minutes, but if the whole quantity had been used, I do not think that it would have required more exertion. The whole process for the pound took sixteen minutes, and the loss upon weighing it, after the process, was exactly three fourths,

without a fraction; so that there was one fourth of very good and soft fibre produced, fit for the hackle.

How far are you of opinion that the hackling process completes the material for the spinner? I have seen the process of hackling by the hand; and I have likewise seen the model of hackling machinery, invented and made by Fenton, Murray and Wood, of Leeds, which by certificate sent to the Society of Arts, appears to be the best machine that had ever been constructed up to that time. I certainly conceive this to be an improvement, but at the same time I think the machine, as it now stands, would admit of further improvement as to velocity; it appears to me to do the work very well, but I have my doubts whether in its present state it will do that work with sufficient rapidity.

What quantity do you suppose a man will be capable of doing in a day? That will be answered by a prior calculation which I made when there were one man and a boy at work; but at the same time I ought to state, I tried the power, and it was nothing like the power of a man; one man might with facility turn several such machines, though each would require a child to attend, for the purpose of feeding and taking out the product.

What is your opinion as to the machine being liable to be easily put out of order? I do not conceive it is subject to get out of order; the rubbing machine will no doubt be subject to considerable wear in the rubbers, but those merely consist of little pieces of beach wood, which may be replaced at any time, by any carpenter in the neighbourhood where the machine may be.

Is not turning three machines too much for a man? I do not conceive it is at all.

Children may supply the rest of the work? Certainly, without doubt.

Have you made any experiments as to the nutritive quality of the chaff? I have not myself made the experiment,

but I requested Mr. Brande, who is professor of chemistry at the Royal Institution, to make the experiment, and I have seen the analysis myself going forward; the result was obtained only this morning; and it appeared to be one-eighth of actual nutritious matter from the quantity experimented upon. Another quantity which appeared to have been materially injured by the weather, which must be explained by some other witness, for I do not know how it came so, yielded one twelfth of nutritious matter, that appeared to me as of the worst quality, and as if it had been subject to wet weather, and had a portion of its nutritive matter washed from it.

Would not that which had gone to seed have less nutritious matter than that taken before seeding? Yes.

Do you know the quantity of nutritious matter in straw and hay? I have not had an opportunity of trying it.

Is there any oil in it? We have not had an opportunity of examining it; but I expect there is, and the general idea of oats is, that there is about one-fourth part of waste, taking it altogether; that the oat itself contains three quarters of nutritious matter, and one quarter in the shell and waste.

It is probable, therefore, that this chaff must be a nutritious food. If this is the case, the nutrition would be about six to one; it would require six pounds of this to render nourishment to a horse, equal to one pound of oats. Mr. Sewell, of the Hounslow Flax Mills, informed me, that he had been in the habit of offering it to his horses, and that when they were accustomed to it, they would leave clover chaff to come to this food.

Are you of opinion that Messrs. Hill and Bundy's machine may be of use to farmers and cottagers at their own homes? I should conceive, in answer to that, that the machine would be too powerful and expensive for small farmers, but that they would be highly beneficial, if they were introduced into districts; for instance, in a work-house or any parish establishment, where eight or ten such small farmers might have access to them.

Have you seen the calculations made by Mr. Hill respecting the number of people that might be employed, if those machines were general? I have seen those calculations.

What is your opinion of them? I believe they are correct, with the exception of one circumstance; I calculate the quantity taken in his pamphlet is rather under what I take it myself. On a supposition, that there are 120,000 acres of flax and hemp annually grown in Great Britain and Ireland, and that on an average three tons of stem are produced, from this number of acres will be 360,000 tons.

By the operation of Messrs. Hill and Bundy's machines, one quarter of the above quantity is obtained in fibre, or - - 90,000 tons

But by the old process of dew-rotting, only one eleventh part of the above 360,000 tons is procured, or - - - - 32,727 tons.

Giving an excess of fibre saved by the new process, from the same number of acres, amounting to 57,273 tons; in pounds 123,291,520.

Now, as on an average it will require half a pound of flax to the yard of linen cloth, this number of pounds would annually make 256,583,040 yards of linen cloth from the additional quantity of flax, hemp, and tow, procured from the same number of acres grown. This quantity of linen cloth selling in the shops, on an average of two shillings per yard, would give an annual increase to our national wealth, from the same number of acres employed in this cultivation, of *l.*25,658,304: exclusive of the cost of the raw material, and the expense of preparing it by Messrs. Hill and Bundy's machines, the expense for spinning and weaving it into linen goods, is taken at *52l.* 17*s.* 8*d.* per ton. This cost of labour on the quantity of flax, hemp, and tow, saved by the operation of these machines, viz. 52,275 tons from the 120,000 acres, would amount to *12,114,747l.* 2 shillings, and which would yearly give employment to

807,649 persons, calculating the value of the labour of each at one shilling per day the year round, and estimating them to work 300 days in each year. This average will not be considered too low, when it is considered, that a large portion of the labour is performed by women and children.

Do the machines of Messrs. Hill and Bundy resemble those of Mr. Lee? I do not myself see any similarity.

Do you conceive those two machines to be likely to produce great national advantages? I certainly think that as far as employment of the poor can produce that, they do hold out very reasonable and fair ground for supposing that a novel branch, or rather an extended branch of manufacture may be introduced into this country, by the improved process of manufacturing flax. There is a great prejudice existing in the country among farmers, from the circumstance of flax making no return to the land; it is unlike other crops, in as much as it is pulled up by the roots, instead of being cut; and by the old process, all that was nutritious in it was wasted or washed away by the process of water steeping; whereas from the analysis, which has just been mentioned, it appears that if the product should be wanted for food, that flax is as capable of making a return to the land as any other crop. Another material advantage in the present process is, that instead of the flax becoming ripe at nearly the time of corn harvest, and requiring to be attended to immediately, it may now be dried in the same manner as hay, and laid up in barns, so as to afford winter employment to farmers' servants and others, at a season of the year when employments very rarely exists in any other form. It would therefore enable the farmer to keep a greater number of servants, with advantage to himself and to the other parts of his farm, than he would want to do if he did not encourage this kind of culture.

It would be highly beneficial also in wet weather? Yes, it would afford means for employment in wet weather.

Have you any mode of calculating the expense of the old process, compared with what it would be by the improved system? I have not.

You said it would require sixteen minutes to pass through both machines, separately; would not both machines work at the same time? Certainly; but it would require preparation between the two processes; there is no doubt but that the two machines might be working at the same time, though, as this was an experiment upon a particular quantity, one machine was standing idle while the other was in use.

Then a pound might be done in eight minutes? A pound would be done in eight minutes, and part of another pound begun; because part would have passed another machine, and you would have had a lapse of three minutes upon the second machine.

What you speak of is a pound of rough material? A pound of flax in its dry state, as it comes immediately from the farm.

How many pounds of flax could be produced in twelve hours, and by what number of hands, by the machine? Twenty pounds, by one man and two children.

Would that machine require the full power of a man, or could he work more machines than one? He could work two machines with three children.

Then the three machines would require how many hands? One man and three children.

They would do sixty pounds? Thirty pounds; twenty pounds the pair of machines, and ten the other machine.

Have you seen the flax-dressing machine employed? I have; and I have stated respecting that, that it went too slow.

Do you know the quantity it would dress in two hours? No, I do not.

Do you know the waste? The waste on what I saw was very little; I merely saw one handful passed through it,

and the waste was not a fortieth, I should think ; but it was not weighed.

Is Mr. Lee's or Messrs. Hill and Bundy's the most simple? Certainly Mr. Lee's is the most simple.

Do you apprehend that Mr. Lee's, being the most simple, is less liable to be put out of order? Certainly it is. That part of Messrs. Hill and Bundy's, that is more liable to be put out of order, consists of beech wood, that could be put in order again by any common carpenter? Except the rubbing part, that contains wheels and some degree of intricacy.

With regard to the rollers, they are not liable to be broken? I conceive not; the only part which would be subject to wear, is the pivots on which they turn, and they could be replaced very easily.

Mr. Lee's machine, you said, had not the effect of separating the woody part from the fibres? The beating process separated it most effectually, but not the rollers; and I ought in justice to say, that Mr. Lee told me, that that arose from the flax not being sufficiently dry; and I then had Mr. Lee's assurance, that it would answer if dry.

Do you suppose the small rolling machine of Lee would complete the business well, if the flax had been good or formed into a skein? I should doubt it very much, without the application of the breaking machine.

Will not the rollers in Mr. Lee's patent tend to divide the fibres, and render the flax finer when brought to the hackle? Certainly; any pressure upon the stalk of the flax so regulated as to cut the fibre, will tend to spread or open it, and make it finer; but that is equally well answered in the rubbing process, for there it is spread; and in the other machine, a simple roller without fluting would answer that purpose.

SAME SUBJECT CONTINUED, FROM LES ARCHIVES PHILOSOPHIQUES POLITIQUES ET LITTÉRAIRES, NO. 2.

It is three or four years since Mr. Lee, in England, discovered the means of preparing flax and hemp without steeping. He obtained a patent. Last year Messrs. Hill and Bundy conceived and executed another system of preparation, which is affirmed to be much preferable to Mr. Lee's method.

The French government, which suffers nothing to escape that can contribute to the national prosperity, has ordered researches to be undertaken at the Conservatoire des Arts et Metiers; and M. Christian, director of this establishment, has bestowed upon it all the attention which it merits; but instead of seeking to find out the mode employed by the English, upon the imperfect accounts which have reached France, he treated it as a question entirely new and unsolved, and his efforts have been rewarded with complete success.

The new method employed by M. Christian is very simple and expeditious; it can be used every where; it requires neither apprenticeship, nor much expense; it is in a manner within the compass of any fortune; and as far as they can be compared, it is equal to the best English system.

The writer of the paper here gives a history of the ancient and modern modes of preparing these plants up to the period of Mr. Lee's discovery, commenting at the same time on the disadvantages of steeping. He then proceeds to give the substance of Mr. Millington's evidence, and goes on as follows:—This evidence of Mr. Millington's is the principal account, which France has obtained, relating to the new English processes; and although we do not find in it an explicit detail, either of the precise form of the machines, of their particular construction, or of the manner in which they are employed, we can at least

appreciate the double system, and compare it with the process discovered in France, and which is entirely different from those of Mr. Lee and Messrs. Hill and Bundy.

It would not be difficult, however, to cause machines to be constructed according to the above described systems, notwithstanding the imperfect description given in the report of the committee of parliament; but we believe our own method is preferable in many respects.

In order to reduce the flax and hemp from the state in which it is gathered to the point proper for hackling, three distinct operations are requisite, which we are able to execute in a manner simultaneously, or at least by the same machine; that is to say, 1st. To flatten the stalk, and to break the woody matter into small pieces length ways; 2d. To crack the woody matter into small pieces again, cross-ways, and to separate them from the fibres; and 3d. To divide and soften the fibres. We obtain these three effects completely by a single machine, composed of two pair of fluted or grooved cylinders, to which are communicated by a handle different degrees of velocity, with a double train.

The first pair which we shall call the *feeding* cylinders, are of iron, of a small diameter, and are fluted longitudinally with angular flutes, not sharp. The second pair, which we shall call the *combing* cylinders, are of wood with iron axles; the flutes or grooves are parallel to the axis, and can be taken off and replaced at pleasure. The grooves are of hard wood, but the edges are covered with plates of iron cut perpendicularly to their length into small flat teeth, rounded at the top and polished on every side; these plates are fitted firmly to the upper part of the grooves; and they are so arranged, that lightly fitting one into the other, their lateral faces rub one upon the other, and do not suffer the plates of iron to touch the wood upon any point in the course of the revolution of the cylinders. The flax stems are distributed parallel and equally upon a board, and kept in this position transversely by a piece of

wood that supports a spring. The points of the flax stems are made to enter the feeding cylinders first, which flatten and begin to break them according to the thickness of the cylinders. These cylinders make one turn, while the combing cylinders make fifteen or eighteen; the little teeth of these cut the outer coat longitudinally, and gradually detach it from the fibres. The fibres are softened and divided by the rubbing of the surfaces of the grooves, and by the action of the small teeth in the rapid rotation of the combing cylinders. Thus we see, that the fibres of flax or hemp come from the combing cylinders entirely separated from the outer coat, divided, softened, and ready to be hackled for making ropes or ordinary linen. The operation is entirely terminated in one minute.

Flax and hemp may be brought to the utmost fineness by taking them from the combing cylinders, washing them in cold water, and immersing them for two or three hours in water slightly acidulated with sulphuric acid, in which they become white and acquire a great degree of fineness. They are dried and softened on the same machine, having in the place of the combing cylinders, two cylinders of the same form; but the plates of iron on the grooves are rounded, instead of being toothed: lastly, they are hackled, and the fibres of the flax and hemp come from this supplementary operation white, silky, and fit for making the finest linen and lace. Our process is extremely simple. The machine is easily constructed, and not expensive; it is even, of small bulk. We cultivate as much flax as they do in England, and we may consider the discovery as even more important to France than to England.

Paris, (Me.) Dec. 18th, 1817.

[Richard Sullivan, Esq. Rec'g Sec'y of the Massachusetts Agricultural Society.]

SIR,

Agreeably to the request of the Massachusetts Agricultural Society, the citizens of this and the adjacent towns have formed themselves into a Society, and have obtained an act of incorporation by the name of the Second Agricultural Society in Oxford County. Almost every man in this vicinity is more or less engaged in agricultural pursuits, but situated in a new and remote part of the country, together with the uncultivated state of our farms, and without any particular source of information, experiment has, as yet, been but little cultivated. There now seems to be a spirit of enterprise and enquiry. We anticipate much from your Society, and every favour will be gratefully acknowledged. Our annual meeting will take place on the first week in January. We solicit some communication from your Society before the spring opens, so that we may be able to diffuse all the information in our power before seed time. We have had but two regular meetings as yet, therefore but little information can be transmitted at this time, some answers to your inquiries are respectfully submitted.

By order of the Corresponding Committee.

BENJAMIN CHANDLER.

QUERIES ADDRESSED BY THE MASSACHUSETTS AGRICULTURAL SOCIETY TO FARMERS, AND THE REPLIES MADE BY THE SECOND OXFORD AGRICULTURAL SOCIETY, IN THE NEIGHBOURHOOD OF PARIS, IN MAINE.

1st. **O**F what quantity of land do the farms in your vicinity generally consist?

Answer. From fifty to two hundred acres, generally about one hundred.

2d. What is the quality of the soil?

Ans. Generally good and strong, rather rocky and uneven, consisting of all the varieties from a wet and loamy to a light and dry soil; good for grass, and until within a few years for Indian corn; but since the cold seasons our lands have produced wheat in greater abundance than formerly.

3d. Into what portions of pasture, mowing and tillage, orcharding and wood, are farms usually divided? Are the orchards improving or declining? Do they yield a competent supply of cider?

Ans. About one fourth in pasture, one fourth in mowing and tillage, the remainder in wood and unimproved land. It is but about thirty years since the towns in this vicinity began to settle, and but little more than twenty since we began to improve in orcharding, which flourished very well for a number of years; but in the winters of 1808 and 1809 many of our orchards were very much injured by the severe cold, and since that time seem to be declining; those which were not so injured are improving. Some farmers produce more cider than is sufficient for their own consumption; but there is not a sufficient supply for the country. No canker worms have been yet seen here.

4th. How much land on an average is annually planted or sown with grain of any kind?

Ans. From five to twenty acres.

5th. In what manner is the land prepared, manured, and seeded with each kind of grain, and what is a medium crop?

Ans. Much grain is raised in this vicinity on new lands, after burning and clearing off the timber. Wheat is raised on old land, after a crop of corn or potatoes. The land is seldom manured, except for the former crop. Product of wheat from twelve to twenty bushels. Rye is generally grown on dry land, prepared in a similar manner, and the

crop about the same. Steeping wheat in lime and water, or scalding it in ley before it is sown, is found to prevent smut more effectually than any other method practised here. [This process of scalding is new to us. We do not recollect it among the European or American processes hitherto published. We should be glad to know at what temperature the grain is immersed, and how long it is suffered to remain in the ley.]—EDITORS.

6th. In what manner is Indian corn cultivated, and what is a medium crop on an acre?

Ans. Mostly on burnt land. The corn is planted from two and an half to three feet apart. Nothing is required afterwards, but to pull or cut up the weeds. On ploughed land it is generally planted the latter end of May, in squares about three and an half to four feet apart—seldom hoed more than twice. Crop from twenty-five to forty-five bushels an acre.

7th. What is the quantity and value of the straw on an acre of barley, rye, oats, and wheat respectively, and to how much upland hay are they respectively equivalent for fodder?

Ans. From one half to three fourths of a ton of rye or wheat straw to an acre, worth from one to three dollars a ton; but in good seasons for English grass no use is made of straw, except for manure. [*Note.*—Is it not worth more than the above prices, even for manure? It fetches ten dollars a ton in Boston for litter only.]

8th. What is the value of straw of each kind for any purpose other than fodder or litter?

Ans. None.

9th. What is the value of the stover or stalks on an acre of Indian corn, and to what quantity of upland hay is it equivalent for fodder?

Ans. About one ton to the acre, and worth from one third to one half of the same quantity of English hay.

10th. What quantity of land on a medium farm is annually planted with potatoes? How is the land prepared? What quantity and kind of manure is applied, and in what manner? How much seed is used, and how selected? How are they cultivated, and what is a medium crop?

Ans. About two acres. We plough once, dig holes about three feet apart, and fill them with coarse manure. About eight bushels of seed is used to the acre. The large potatoes are usually cut into two or three pieces, and the small ones planted whole; crop from 150 to 250 bushels per acre.

Of late some plant potatoes on stubble ground and without manure. After furrowing the land about three feet apart, the potatoes are dropped in the furrows about one foot apart, which method is thought to produce, not only larger potatoes, but a much greater quantity to the acre.

11th. How many bushels of potatoes are equivalent to a bushel of Indian corn *for sale*?

Ans. About four.

12th. How many days labour of a man are usually employed on an acre of Indian corn, including getting it in and husking it?

Ans. From twelve to sixteen days.

13th. What is the labour of shelling a hundred bushels of Indian corn, and how is it performed?

Ans. By threshing, about five days' labour.

14th. How many days labour of a man are usually employed upon an acre of potatoes, including getting in the crop?

Ans. From nine to twelve days' labour.

15th. Is there any order or succession of crops known to be beneficial or pernicious to the soil? If there is, what is it?

Ans. Flax is thought to be pernicious. Planting with potatoes, followed with rye and wheat, the stubble plough-

ed in and laid down with red clover, is deemed beneficial.

16th. What is the usual course of crops ?

Ans. First potatoes, then corn, then rye or wheat.

17th. What is the average quantity of hay produced on an acre of upland, and what the labour of mowing, curing, and housing it ?

Ans. About one ton, and three days' labour to secure it in good weather.

18th. What is the medium product of hay on an acre of fresh meadow ?

Ans. We have no fresh meadow in this vicinity.

20th. Is any tillage land laid down with grass-seeds, without sowing grain at the same time ? If so, which method is best ?

Ans. None.

21st. What are the kinds of grass cut on the upland for hay ? What proportion from seed sown by hand ? What are the kinds thus sown, and what quantities of each respectively ?

Ans. Herds'-grass and red clover. Seed from four to six pounds of clover, and two to three quarts of herds'-grass-seed to the acre.

22nd. Are any grass lands seeded after scarifying them with the harrow only, or in any other mode without ploughing, and what is the success of such practice ?

Ans. None.

23d. What weeds, vermin, or seeds infest the mowing lands ?

Ans. Thistles, yellow-weed, or butter-cup, and grass-hoppers.

24th. Are the natural or cultivated grasses infested most ?

Ans. The cultivated.

25th. What methods are used to destroy weeds, vermin, or insects, and with what success ?

Ans. Frequent mowing destroys thistles, better than ploughing.

26th. What kind of beasts, and in what numbers are kept on a medium farm? And how are they subsisted?

Ans. From one to two horses; from ten to forty horned cattle, and from ten to sixty sheep pastured in summer, and fed with hay in winter.

27th. In what place, and in what manner are the cattle fed with the coarse winter fodder? Is it given in the stable, in the yard, or in the field? Is it chopped or given whole?

Ans. Good hay is given in the barn; the poorest and coarsest fodder in the yard. It is not chopped.

28th. How much butter is usually made in a year from a cow, the whole cream being churned? And how much skimmed milk cheese from the same cow?

Ans. None are so managed in this vicinity.

29th. What food is given to sheep besides grass and hay?

Ans. Corn, beans, and potatoes; but little is used in this part of the country, except hay.

30th. What is the value of the subsistence of a sheep through the year besides pasturage?

Ans. From one dollar to one dollar fifty cents.

31st. What is the value of the pasturage of a sheep compared with that of a cow?

Ans. Eight sheep without lambs, and five with lambs.

32d. What is the ordinary weight and value of the flesh of a sheep fit for the butcher? And what the quantity of wool in a fleece?

Ans. From ten to sixty pounds of flesh, three pounds of wool.

33d. What breeds of swine are propagated? How fed, how fattened? At what age killed, and what their weight?

Ans. A mixed breed, generally of small bone; fed in summer with skimmed milk and whey; fattened mostly on potatoes with some meal, sometimes with corn, and sometimes with meal of oats, or oats and peas. Killed at the age of eighteen months; weight from 200 to 300.

34th. What number of bee-hives are kept, their product in honey and wax; what management, and what obstacles to their extensive propagation?

Ans. We are beginning to keep bees; they appear to prosper very well, but we have not much experience in their management.

35th. What is the usual quantity of land sowed with flax; how manured and cultivated? And what is the medium produce of flax and seed in quantity and value?

Ans. From one fourth to one acre, manured with old manure; cultivated by repeated ploughing before sowing. Crop from 150 to 250 pounds an acre; value seventeen cents a pound.

36th. How much labour is employed on a quarter of flax before it comes to the spinner, and including preparing the seed for market.

Ans. From eight to ten days.

37th. In what consists the surplus of the farmer, which is sold or exchanged for other articles?

Ans. Butter, cheese, beef, pork, rye, wheat, beans, peas, &c.

38th. How many loads of manure are collected (estimating thirty bushels to a load) from the barn yard of a medium farm, specifying the number and kinds of cattle kept on the same farm, and the manner in which they are kept in relation to confinement or ranging abroad?

Ans. Twenty horned cattle, three horses, and forty sheep, produce sixty loads, confined in the night, and suffered to go at large in the day.

42d. In what manner, and to what uses is manure applied, except those above indicated?

Ans. To none.

43d. What other manures are used, except those produced by the stock?

Ans. Not any.

44th. Is limestone found in your vicinity, and to what uses is it applied?

Ans. It is found in many places, but not used as a manure.

45th. Is buck-wheat cultivated for food? Or is it used as a fertilizer of the ground?

Ans. It is but little cultivated, and that only for food for hogs and horses.

46th. In what manner are new lands brought under cultivation? Is it customary to plant orchards in new settlements?

Ans. The trees are felled in June, and burnt the succeeding fall or spring; the small stuff is then piled and burnt, and the ground planted with Indian corn. The next spring the timber is chopped into convenient lengths, piled and burnt, when the ground is sowed with grain and grass-seed. Many orchards are planted in new settlements.

47th. How is land cleared, which is over-run with bushes and underbrush?

Ans. By cutting and burning them.

48th. How are swamps and swampy land cleared?

Ans. Few attempts are as yet made to clear them.

49th. Is the growth of wood for fuel and timber sufficient for consumption in your vicinity? If not, what measures are taken to provide against a scarcity?

Ans. Large tracts of our country are full of wood, and of course no measures are taken to provide against future wants.

50th. How far has gypsum or plaster of paris been fairly tried in the maritime parts of our coast? What have been the effects of the experiment?

Ans. We are unacquainted with it.

51st. Is it perfectly ascertained, that with proper attention to manuring land it is more advantageous to change the crops than to keep it in grass?

Ans. No experiments of the kind have been made.

52nd. Is there any crop more profitable than grass at a distance from market?

Ans. None.

53d. What has been found to be the difference of profit between merino and other sheep?

Ans. Many people in our country, from prejudice or some other cause, dislike merinoes. We think the profit of them nearly double the old stock of sheep.

54th. Is there any fodder for sheep, which will diminish or supercede the consumption of hay in winter?

Ans. We know of none.



TRANSLATION OF A LETTER FROM HIS EXCELLENCY
HYDE DE NEUVILLE, MINISTER PLENIPOTENTIARY OF
HIS MOST CHRISTIAN MAJESTY TO THE TRUSTEES OF
THE MASSACHUSETTS AGRICULTURAL SOCIETY.

Legation of France to the United States.

Washington, Sept. 28, 1818.

GENTLEMEN,

I HAVE received with great sensibility the diploma, which the Massachusetts Agricultural Society have been pleased to present to me. I appreciate, as I ought, the honour they have conferred, by associating me in their labours. My efforts, in concurrence with them, in promoting this science most useful to men, will evince, I trust, the extent of my gratitude.

I send by the present mail to the consul of France, at Boston, a list of seeds which have been sent to me by the directors and professors of the museum of natural history, at Paris.

I pray that your society will have the goodness to point out those, the culture of which may be useful to the state of Massachusetts. I shall be extremely happy to be able to render them this service, as speedily as possible.

I take the liberty, moreover, to propose the establishment of a regular interchange between me and them, of

European seeds, and those of the northern parts of the United States.

Such connexions between nations cannot but redound to their mutual advantage. They are easily formed, and it is quite time, that agriculture and commerce should cement and secure the union of nations.

Be pleased, Gentlemen, to make known these sentiments to all the members of your Society, and accept for yourselves the assurances of my high consideration.

The Envoy Extraordinary, and Minister Plenipotentiary of His Most Christian Majesty, to the United States.

HYDE DE NEUVILLE.

[The following article on artificial grasses by the President of the Virginia Agricultural Society, we have selected, not so much because the ideas are new to New England farmers, since the value and importance of artificial grasses are well understood with us, and their cultivation forms a part of the husbandry of all our farmers, but we think there are many excellent remarks in this essay, as there are in all those, which have proceeded from this gentleman.

We insert it also partly from courtesy, and to shew our readers the interest which is now felt in other parts of the United States on the important subject of agriculture, and the enlightened zeal with which it is pursued.]

AGRICULTURAL SOCIETY OF VIRGINIA.

Paper communicated by the President, Col. J. Taylor, and ordered to be printed

ARTIFICIAL GRASSES.

IT is universally agreed, that a constant impoverishment of land must ensue from tillage, without the renovation produced by manure and vegetable matter—hence, the cheapest and most ample supplies of these renovators is a primary subject; as neither the improvement nor preservation of the soil can be effected without using the means. It was seen as early as in the time of Columella, that the efforts of nature to furnish us with these means, without the aid of

culture and art, were incompetent to the end ; and nearly equivalent in value to the spontaneous supply of food by the wilderness, compared with the supply from industry and cultivation. Writers reason from this discovery as an axiom, and prove that the fertility of old countries bears a strict relation to the use made of it. Egypt itself owes its fertility to its annual alluvial manuring. Thus the culture of artificial grasses attracted great attention, wherever a system of agriculture existed, worthy of any degree of commendation ; it being seen that the prosperity of nations, as well as of farmers, was evidently graduated by the degrees of skill and industry with which this axiom was practised upon ; and that they were the chief means for its practical effect. Whilst a country is fresh and the soil saturated with vegetable manure, it constitutes a temporary case ; and a vast extent of uncleared lands will long keep out of view the means for preserving the good, and improving the exhausted. But when it has passed the vigour of youth, and exhibits the marks of old age, the alternative of reducing it to barrenness, or of adopting the only mode in existence for restoring its fertility, lies before the eyes of its inhabitants. Excepting a few strips of alluvial land, there is no cultivated country, in which a dependence upon the natural grasses is more hopeless than in Virginia. A thin soil, exposed to hot and dry summers, not only prevents our lands from clothing and nourishing themselves, but has at length rendered them even unable to raise working animals for their own cultivation, and a sufficient supply of meat, milk and butter for their own cultivators. A remedy for this state of things is necessary to stop the emigration from Virginia, and to prevent its ultimate depopulation. If the culture of artificial grasses is the chief remedy, it can only be overlooked, because it is not embellished by the glittering ornaments of novelty, and only assumes the plain garb of reason and experience.

Before the effects produced by a skilful culture of the artificial grasses are enumerated, let us take a glance at them, collectively, in other countries. In Holland, where the cultivation of grass is generally preferred to that of bread, land sells higher as land, without having its price enhanced by adventitious circumstances, than in any other country. The industrious and profit-loving Dutch choose rather to import, than to raise their own bread-stuff, at the expense of diminishing the culture of artificial grasses. They are as little likely as any people in the world, to make an election by which they would lose money. In England, the cultivation of grass is so much more profitable than that of bread-stuff, as to have obtained a preference, at the expense of considerable importations of the latter. The bearings of this fact are weighty. Hay and butcher's meat in England, are nearly of the same prices as in this country—whereas, wheat there, is often three times dearer than wheat here, and seldom less than double in price. Yet the English farmers prefer raising artificial grasses, to raising wheat. Again, the rent as well as price of land, is constantly highest in those countries, where the culture of artificial grasses is pushed farthest. In England, the rent of fine artificial meadows, sometimes extends to twenty dollars an acre, rarely diminishes to ten, and is never as low as the rent of adjoining arable land, however good. As the rate of rent is settled by the rate of profit, it follows that even there, where the prices of meat and hay approach much nearer to our prices than the price of wheat, it is most profitable to raise the articles of inferior price. Much light may also be extracted from a comparison between the general rate of rent here and in England. It must be our best land, which would rent at one dollar an acre for a term of twenty-one years; and even at this low rent, both the land and the tenement are generally ruined. In England, much of the arable land rents at about ten dollars an acre, and its average rent is about six. But

there, the culture of artificial grasses is invariably mingled with the culture of grain. Now when we see the best grazing land there, renting higher than the best arable land, and their farms renting ten times higher than ours, does it not plainly follow, that both a great profit and a vast improvement of the soil must arise from the culture of artificial grasses; and that the difference in rent between their farms and ours, is in a great measure produced by the latter circumstance? This conclusion is warranted by the fact, that the longer the term of a lease is, the higher is the rent there, and lower here; because the tenant in one case, calculates upon a mode of tillage which will improve the land; and in the other, upon its becoming poorer. What but the use of artificial grasses, and their exclusion, has made both these calculations correct?

Let us now resort to indigenous facts. Lands sell and rent higher in the U. States, in proportion to the extent and skill with which artificial grasses are cultivated. There is no doubt, but that here, as abroad, profit is the only permanent basis of price and rent; and as the highest price and rent attends the culture of artificial grasses, the greatest profit must also attend it. Both at home and abroad, the land nursed by artificial grasses, is known to be so much richer and productive, both of grain and meat, than lands not so nursed, as to pay labour far better, without taking into the account a long list of other benefits arising from this system of culture. The most productive bread-stuff farms, are those whereon grain is raised on grass lays. Of this fact, the slightest observation, experience or reflection, would convince the most incredulous.

The general conclusion, that grazing ruins land, as we know from experience, when applied to natural grasses only, but enriches it when combined with a skilful management of artificial grasses, as in the cases of Holland, England, and some parts of the United States, suffices to excite those who love their country or themselves, to inquire

after the practical modes of a system, which experimentally enriches us both, and solicits an attention to the distinct items of profit, by which these desirable ends are produced.

1. The phrase "artificial grasses" implies a selection from the gramineous family, and a culture by human art, of the kinds best adapted to the soil and climate of a country, in preference to a reliance upon the grasses produced naturally. The great value of this selection, is illustrated by the contrast between the crab of the wilderness, and the cultivated pippin of the orchard; or by a comparison between the esculents of a garden and those of spontaneous production.

2. An improvement of the soil by the culture of artificial grasses, arises from the vegetable matter of both root and top, when ungrazed; from the former when grazed; from protecting the ground against heat in summer and cold in winter; from producing food to raise animal manure; from rendering the ground fit to bear deeper ploughing, by reason of the mass of vegetable matter mingled with it, that it can bear in a naked state; by which its soil is deepened, and from saving four fifths of the farm from the hoof and the tooth, by making one fifth far more adequate to supply the demand for grass, than the whole without such culture. The profit arising from this improvement of land by the use of artificial grasses, is exhaustless and incomputable.

3. Artificial grasses enable the farmer to raise meats of all kinds, for his own use or for market, of the best quality, in the cheapest modes; and to increase the size of all animals destined to slaughter or labour. The latter, by being raised in the climate where they are to work, are hardier, healthier, and better adapted for their employments. And whilst the farmer saves the expenses of purchasing sorry meat and teams, he gets good without expense; because by a skilful management of artificial grasses, the manure they cause domestic animals to produce, will more than re

pay in the improvement of soil and increase of crops, the expense of their maintenance. This item of profit is too important to be hastily passed over. Men chiefly subsist upon grain and meat; brutes, upon grass, green or dry. The difference between the expense of cultivating an acre of grain and one of grass is inconsiderable, and yet the latter will raise far more meat, butter, tallow, leather, and wool. Let any farmer calculate the expense of supplying himself with these articles, in the present mode, even excluding its heaviest item, (that of injury to the land,) and he would probably discover that most of all of them he raises cost him three times their market value. The loss however upon what he sells is trifling, compared with the loss upon what he uses; because he consumes much and sells little. When the temporary supplies from the western country diminish or fail, the evils attending upon our present mode of raising stocks, will require no proof. The arts of agriculture are as necessary to improve and increase the sustenance of beasts as that of men. Grass being the basis of food in the case of stocks, as bread stuff is in the case of man, that mode of obtaining it which produces the most and best, with the least injury to the land, and from the smallest space, is entitled to a preference. Without the cultivation of artificial grasses, our domestic stocks occupy the precise ground occupied by mankind, when excluded from the artificial modes of raising bread stuff, and experience the fate of a state of agriculture, as to them, uncivilized.

4. The artificial grasses produce a considerable profit by saving labour. If the labour applied to an acre enriched by artificial grass, was equal to that expended upon an impoverished acre, a vast saving would still result from the difference of the crop; as the expense of labour must be computed in relation to its produce. But the fact is, that the poor land requires the most labour, whilst it produces the worst crop, because being filled with seeds of worthless

or pernicious annual grasses or weeds, and being incapable of bearing a ploughing sufficiently deep to deposite these seeds beyond the reach of vegetation, it requires double the work to destroy them as they sprout and grow after every rain, which would suffice if they were extirpated. This cannot be effected on poor land without killing it. On such the wheat which follows corn, though the corn required and received six or seven workings, is always more infested with annual grasses and weeds, than that sown upon only a single furrow turning under good perennial grasses, because they smother all animals, and any seeds of the latter remaining, are buried by one deep ploughing, which the earth is able to bear below the reach of vegetation. Hence in the culture of corn upon a perennial grass lay, as in a fallow for wheat, half the labour required by poor lands may be saved; because but few of the annuals appear after one deep ploughing, and as the perennials hardly appear at all in the summer, very little culture is required; and the crop is not only increased by the artificial grasses turned in, but by being freed from the frequent laceration of its roots, caused by frequent ploughings necessary to keep under the quick growing annuals infesting thin land. The wheat also following corn planted on a perennial grass lay is cleaner; for although the perennial grass seeds will often sprout in the spring, and although they ought universally to be sown with or upon the wheat, yet a providential aptitude for the benefits they bestow, is discernible in their slow growth until the wheat crop is perfected; whereas the annuals often grow as rapidly as the wheat itself. There are many weighty items of profit belonging to the labour-saving article, by the culture of perennial grasses. By diminishing arable space, whilst the crop is increased, the diminished space consumes less labour. From a division of the objects of labour, a succession of employments ensues, enabling a farmer to prevent either from suffering by the want of cultivation in due sea-

son. For instance, a full crop of corn and wheat, or a crop equal to the whole labour on a farm, is the consequence of comparing labour with space; and a great demand of both crops for labour at the same period, especially if aggravated by unpropitious weather, generally produces some neglect, and often a considerable loss. By diminishing space, not only without diminishing, but actually increasing produce, these crops will be more manageable by the labour, and receive a better cultivation. And the time saved by this diminution of space, is moreover profitably employed early in the spring, in applying manure and sowing grass seeds; previously to the wheat harvest, in making hay; in autumn, in ditching and draining, fencing and stubbing; and at all times in a variety of less important, but improving occupations. Thus the losses accruing both from a surplus of labour at one season, and from its deficiency at another, are avoided. Some labour is saved by the effect of the roots and tops of perennial grasses, to keep the ground loose and friable; and much, after it is thrown into high ridges of five and a half feet width, because when the ridges are reversed, very deep ploughing is more easily practicable, by turning the earth back into the furrows without working at all on the space these furrows occupy. By the friability of the ground, resulting from a great quantity of vegetable fibres, we are also secured against its baking, and save the labour necessary in that event, for crumbling or reducing it again into a proper state of vegetation. Naked ground possesses neither of these advantages. It is unable to bear the deep ploughing necessary for forming proper ridges, and it is liable both to wash and bake from heavy rains, so as to require much severe labour, again to level and pulverise it, highly prejudicial to the crop.

5. But the greatest benefit from the cultivation of artificial grasses, arises from their exclusive capacity to make highland meadows. Some grasses are so well adapted for

high, dry, and hilly land, if the soil is improvable, that it may very often be made more valuable and more productive than low land meadows. The expense of clearing and draining the latter, will generally exceed that of manuring the former; yet draining is considered every where as highly profitable and useful. The comparative expense between that and making highland grass, is not materially affected by the probable comparative profit. A good spring crop of high land grass is more common in our climate, than of low land. It is not exposed to inundation. A pound of high land grass, green or dry, generally contains as much nutriment as two of low land. It is more easily made into good hay. And highland grasses possess the great and exclusive value of enriching the high and dry lands on which they are sown. These considerations disclose items of profit, resulting from the culture of artificial grasses, which, when united, warrant the conclusion, that it is capable of rendering a great proportion of our high, dry, and hilly lands as valuable as reclaimed meadow land.

It is next to be considered what grasses are best adapted to the soil and climate of Virginia, and consequently most worthy of selection. The merit of red clover as an improving high land grass, is too well established to require proof. Its defects are, that it is speedily destroyed by grazing; bearing, however, that of hogs the longest; that in our warm and dry summers, it soon perishes without being grazed, especially on sandy soils; that it is difficult to be made into hay; and that its hay can only be preserved by particular exertions. It stands, however, hitherto unrivalled in its capacity to enrich the ground, if left uncut to be turned in by the plough. Timothy, in the lower parts of the state, especially if grazed, is also liable to an early death; to be eaten out by broom straw; to have its leaves burnt and dried by the sun before it is fit to be cut; and to ripen so late as to incommode the wheat harvest, with-

out possessing the quality of waiting long for the scythe. In the section of Virginia below the mountains, it must also be assigned to the class of low land grasses. The red top, or herd's grass, as it is indiscriminately called, is superior to timothy in many respects. It lasts longer; it bears grazing better; its leaves are not so liable to be sun-burnt; it resists invaders much more powerfully—sown, mixed with timothy, it casts out the latter in two or three years; and although it ripens about the same time, it waits longer for the scythe, without sustaining any considerable injury. This grass, like timothy, is better adapted to reclaimed low lands than to high; though it succeeds on the latter, better than timothy. The best grass which I have tried in many respects, is one commonly called “the highland meadow oat.” I have had no means of ascertaining whether it is a species of rye grass, or of the *avena pratensis*, or neither, nor whence it derived the appellation “Peruvian,” by which I have heard it distinguished. With its qualities I am better acquainted, having carefully observed them for many years. It ripens as early as the red clover, and is easily made into fine hay, if cut in proper time. Its earliness is of vast importance in our climate. Thence it happens, that it produces heavy spring crops, like red clover, as it commonly perfects its growth before a drought occurs. It is the hardiest grass I ever saw, and bears drought and frost, heat and cold, much better than any I have tried. It keeps possession of the land in spite of severe grazing. It flourishes best on soils suitable for red clover, but it will live on, and improve lands, whereon red clover will perish. It furnishes better grazing early in the spring, late in the fall, in droughts and in winter, than any grass known to me. Ripening with the red clover, it is peculiarly fitted for being sown with it, because it greatly facilitates its conversion into hay, and retains possession of the ground for years after the clover has disappeared. Alone, cut before the seed ripens, its hay is as nutritive

and pleasant to stocks of all kinds, as any I have ever used; and it will yield both seed and tolerably good hay at one cutting, as it ripens soonest at top. Mixed with favourite grasses of grazing animals, it is partially rejected, but eaten as they fail. Alone, it is greedily fed upon. After being cut or grazed, if left to grow, it rises anew, almost with the rapidity of lucerne, with a vigour but little diminished. Fifteen years' experience has not enabled me to decide as to its capacity for improving the soil, because the small quantity of seed first obtained, by confining experiments to small patches, long concealed its qualities; and the large lots first sown, have remained too flourishing to require manure, and too valuable to be ploughed up. It produces (after it has once come to perfection, in doing which it is one year slower than red clover,) ungrazed and uncut, a warmer and more lasting cover than the clover, which has recently induced me to mix and sow it with wheat on a large scale, for the end of improving the soil; in which anticipation I have yet discerned no cause for apprehension. For this purpose, it possesses one recommendation beyond clover. It does not grow and spread so rapidly in the fall or spring as to injure the crop of wheat with which it is sown, as is sometimes the case with clover. Upon the whole, whatever doubt remains as to its fertilizing power, the conclusions that it eminently possesses the qualities for lasting, grazing, and making high land hay, may, I think, be confided in. But it does not, so far as my trials have extended, succeed in lands originally wet, however well they are drained.

As the end designed to be produced by the previous observations, comprises their value, a plan for the management of a bread stuff farm, combined with high land meadows and artificial grasses, is the remaining subject suggested for consideration. Let us suppose a farm to consist of one thousand acres of arable land; that the greatest produce of bread grain, not in one year only, but in a course of

years, is the chief object; and that the labour on it is adequate to its cultivation in the three-shift mode, that is, to having two-thirds of it annually in corn and wheat. To discover whether the profit to be expected from this style of cultivation will be equal to that arising from the system presently to be proposed, we must first glance at its defects. It impoverishes the soil. Grass seeds cannot be beneficially sown with or upon the wheat crop, because the land is too poor to nourish them, and their destruction by the plough returns too rapidly. Pasturage is scarce, bad and impoverishing to the land; and the farmer is thereby disabled from raising within the farm, teams, meat, milk and butter, for his own consumption and comfort, and moreover exposed to annual expenses to supply the deficiencies. The labour being computed by space, and not by produce, and a great demand for it being concentrated in one portion of the year, losses accrue from its insufficiency to meet temporary pressures, and at other seasons for want of beneficial employment. The crop computed by the acre, is upon an average, surprisingly small, whilst as much labour is necessary for its cultivation, as, differently managed, would in a few years increase it per acre four-fold. Let us contrast this abridgment of the three-shift system, with an abridgment of that proposed to be substituted for it.

Let eight hundred of the supposed thousand acres be divided into four shifts of two hundred acres each, one to be annually cultivated in corn and sown in wheat, so that two will yield a crop every year. As much as possible of each shift should be mowed the year it is planted in corn. This may be extended in a few years to one hundred and thirty acres, (exclusively of the twenty presently mentioned,) by ordinary management. Clover should be sown on the wheat in the spring, or meadow oat with it in the fall, and these eight hundred acres should remain ungrazed; of course, four hundred lie untouched for two and an half years, to allow time for a large produce of vegetable mat-

ter, devoted to the improvement of the soil. Let the remaining two hundred acres be appropriated chiefly to grass, and be divided into ten equal lots, one to be highly manured annually, and cultivated in pumpkins, potatoes, peas, cotton, turnips, or any cleaning crop, to be followed by wheat and grass seed, if these crops are gotten off in time to sow wheat, or by oats and grass seed, if they are not. Thus two lots, or forty acres of this portion of the farm, will produce each year heavy and valuable crops, whilst a rotation will be established, sufficient to keep the grass lands clean and in good heart. Three of the other eight lots ought annually to be cut for hay, and five to be reserved for grazing, out of which last number should be annually taken the lot to be manured, so that none will sustain above five years' grazing before it is recruited. The five lots devoted to that service ought to be grazed in succession, both to alleviate the impoverishment it produces and to increase the produce of grass. Hence he who aims at agricultural perfection or elegance, will divide these ten lots by ditches and live hedges of holly or cedar, (the former a conjectural, the latter a tried plant,) or at least by the usual fences. Even ditches alone would be of some use. But in the infancy of improvement, attendants of old men, women, or children, are a tolerable resource, producing also the good effect of habituating the last in early life to employment, and advancing their health, with the precaution of folding the cattle in bad weather. The temporary resource is, however, greatly inferior to inclosures, particularly to the living or imperishable. Under this system, product, instead of labour, will soon be computed in reference to space; and bad agriculture, being detected by the miserable crops this mode of computation will disclose, will shrink gradually out of sight, through shame. The means of raising manure, and the most beneficial employment for teams and manual labour, will soon present themselves in those seasons of the year now lost or trifled away.

I speak not from theory when I say, that the farm well managed, according to this system, will, in twenty years at least, return back to its original fertility. I add, as an inference from this fact, that supposing contiguous farms of one thousand acres each, one in the usual state of impoverishment and the other in woods, the former to be thus managed, and the latter in the customary mode, with the same amount of labour; that the proprietor of the first would make far more profit, and find his land at the end of the term of far more value than the proprietor of the latter. If these rival farms were in an equal state of impoverishment, at the commencement of the experiment, I have no doubt but the first would produce three times as much bread stuff in twenty years as its rival, independent of its inferior productions, and of its exclusive improvement.

A great annual increase of manure is the soundest test by which a farmer can discover whether he is successfully practising the proposed system or not. On the area from which it was taken, five acres were hardly manured eighteen years ago, and now the resources of the farm alone sometimes reach to one hundred and fifty. It is a bread-stuff farm, and grass is used in strict subserviency to that object, for the purpose of enhancing its profit. If gypsum, marle, a neighbourhood to towns, or any adventitious mode of enriching land, can be added to the supply of manure on such a farm, the process of improvement, and the gratifications of increasing profit, may be accelerated.

The large area upon which the proposed system is calculated, is no obstacle to its application to any other. Its proportions may be applied to a farm of any size. This scale was adopted for the purpose of awakening the best informed order of farmers to the calls of patriotism and self-interest. Intelligence effects great objects by reflection; ignorance from imitation; and though a prosperous state of agriculture depends much upon small farmers, be-

cause they possess by far the greatest portion of the national lands, perhaps also of the national industry, its introduction depends upon the successful example of the large ones, who have time, capital, and talents adequate to the cultivation of a science abounding in difficulties, and requiring no small degree of reflection. The merchants of Scotland, who had retired from trade, began about fifty years ago to assail, by precept and example, the then execrable system of agriculture habitually practised in that country, and have supplanted by another, which has diffused a rich service over a great space, previously occupied by a cadaverous degree of sterility. As we neither love our country less, nor confess an inferiority of intellect, an equal share of effort and perseverance by gentlemen farmers, will certainly be crowned with as much success as the efforts and perseverance of these gentlemen merchants, since our auxiliary advantages of soil and climate are greater. They effected their patriotic design, chiefly by the introduction of the artificial grass culture; and when we consider the favourableness of our climate for great spring crops of grass, frequently demonstrated by as heavy crops of clover as we hear or read of, and also its favourableness for converting them into hay, no reason exists for despairing of obtaining the wonderful state of fertility which a country, less favoured by nature, has acquired by the same means.

I admit that a farmer may make a less crop than usual, the first or second year after he adopts the recommended system, unless he begins with a due attention to manuring; but I deny that his profit will be less, because his diminution of crop will be more than compensated by the improvement of his land. An average of the first four years will probably produce a crop numerically equal, at least, to his usual-crops; but then his profit will be greater, because having raised it from less space, he will have saved much labour for improvement, and his land will be in better heart.

Afterwards his crops will numerically increase gradually to an extent I cannot foresee. Should a man calculate by his hopes of life and chance for self-gratification, without any regard for contemporaries or posterity, he ought to adhere to the prevalent system of agriculture, if he expects to live two years only; if but four, his determination may admit of some doubt; but if he expects to live longer, it ought to admit of none. Even principles so narrow, will dictate to him an abandonment of the present land killing habits. A calculation which looks forward but two years, cannot possibly procure success for any agricultural system, except one for exhausting the land as soon as possible. All men, who calculate on so short an interest in the product of land, will strive to increase it to the utmost extent, at the expense of the land itself. A proprietor, sure of dying in one or two years, would improve but with little spirit, though his land was to descend to his children, but a possessor for one or two years, likely to lose the land and live, must feel a great lassitude in improving for future profit, which he cannot keep, for future enjoyment. No good system of agriculture can possibly take place, under the suggestions of these impulses.

I admit also that disappointments will happen from feeble and unskilful trials. Complete success will too often be expected from partial attempts. The imagination can magnify the disrupted toe of a statue, into an entire image, and brood over a fragment with self-complacency; and fanaticism can expect wonders from relics transmitted from ignorance; but it is to be hoped that such cases will be rare in this age of intelligence and free inquiry; that the prejudices imbibed from old habits will be exploded, and that the industry and good sense of the Virginians will rapidly improve all suggestions, the tendency of which is to preserve their country from decay, and themselves from indigence.

An observation is reserved for the conclusion of this essay, to face an opinion, not less erroneous than common; and not less hostile to profit than to improvement. It is too often imagined, that a rotation requiring the interposition of artificial grasses between exhausting crops, is slow in its return of profit, and demands an extraordinary capital, to supply for a time the necessities arising from this delay. But from long and attentive observation, I have confidently concluded, that no crop requires less capital, than these grasses, or is equally rapid in its returns of profit. The labour which cultivates other crops, prepares the ground to receive grass-seeds, and they are mingled and sown with grain. Seed is therefore nearly all the extraordinary capital this system needs, when the artificial grasses are grazed, or devoted to the enrichment of the soil; and the expense of converting a portion of them into hay, though not as trivial, is yet inconsiderable. The returns of profit are infinitely more copious and lasting, as well as more rapid, than those made by any other crop. They suddenly yield milk, butter, cheese, meat, wool and leather. Manure, an increase of grain and other crops, and good working animals, soon follow. At every rotation, when ploughed in ungrazed, they present to the farmer an improved soil, without causing additional expense, or requiring additional labour. On the contrary, so far as artificial grasses are thus used, they save him more labour in the single article of fencing, than they consume. And finally, the profit of the system becomes so incorporated with the soil, whilst it is also enjoyed by the reaper, as both to last long, and annually to generate profit upon profit, in a ratio outstripping the fecundity of compound interest.

INSECTS WHICH AFFECT THE OAKS AND CHERRIES.

It has been observed, that America is "the land of insects." This observation is strikingly just as applied to

the meridional and tropical parts of this quarter of the globe; in which these animals are equally remarkable for their numbers and conspicuous for their magnitude; but it may, perhaps, be as truly said of a great part of the northern portion of it, where, though much diminished in volume and often very minute, the observer will find them surprisingly copious. These diligent and faithful servants of nature, as Linnæus calls them, are perpetually engaged in destroying all that is dead, and in checking the increase of all that is living in the vegetable world. In the execution of the task assigned them, they often frustrate the designs and subvert the arrangements of man, thus constraining him to attend to objects which are generally deemed beneath his notice, and obliging him to feel how effective is the smallest instrument in the hand of Omnipotence.

In this paper it is intended to lay before the board of trustees of the Massachusetts Agricultural Society some notices of two insects, one of which inhabits the forest, the other is injurious to fruit trees.

For several years past the ground beneath the black and white oaks, has been observed to be strewed with small branches of those trees from eighteen inches to two feet in length. Mr. Sullivan assures me he has found them five feet in length, and an inch in diameter. The falling of these branches is occasioned by the larva or grub of an insect which, when its feeding or larva state is nearly completed, eats away the wood in a circular direction, leaving only the bark entire; this is broken by the first strong breeze, and the branch with the larva in it, falls to the ground. From this effect of its labours, it may be called the oak-pruner.

At the meeting of the Board of Trustees at the seat of Gorham Parsons, Esq. on the 23d of July last, the Hon. Mr. Sullivan produced several branches of oaks which contained larvæ. Five of these I brought home, reduced

them to four or five inches in length; and in order to determine whether the larvæ descended into the earth, threw them into a vessel nearly filled with light garden mould, covering the vessel with a piece of window-glass, both to prevent the escape of the perfect insects, if any should be disclosed, and to retard the drying of the mould.

I imagined that as the larva is enclosed in the fallen branch with a sufficient supply of nutriment to carry it through the feeding state, that it was intended it should enter the earth when that state was passed, and that it was impelled by instinct to cut off the branch, that it might be brought in safety to the ground before it was quite ready to quit the wood; but my conjecture was erroneous; there must be some other reason for this process.

A degree of humidity is necessary to favour the development of the parts of the perfect insect while it is in the nympha state; in the body and larger branches of trees the moisture is sufficient for this purpose; but in these small branches, which are killed, the moisture would be exhaled by the action of the sun and wind if they remained on the tree, whereas by their falling and being thus placed nearly or quite in contact with the moist earth, their humidity is preserved. It was not precisely with this view, that the prepared branches were treated as above mentioned; but the purpose was attained. The vessel was kept in a warm room, the wood was kept moist, and one perfect insect made its appearance in November, another in December; but I believe they would not have been disclosed till the spring, if the branches had remained abroad.

The insect belongs to a tribe composed of a number of genera called capricorn-beetles and wood-eaters. The genus of which it is an undescribed species, is named by Fabricius, *stenocorus*. Linnæus would have called it *cerambyx*. It is of a dull brown colour, a little brighter on the under side, every where dotted with impressed points, and sprinkled with short whitish hairs which lie close to the

surface; these give it a grayish hue under the magnifier. The antennæ are about as long as the whole insect, tapering a little from the base to the point, and have ten joints, of which the second and third terminate in a small spine. The thorax is even, without any prominences; and the elytra or wing cases have each two points at the apex. Individual insects differ considerably in magnitude, from four and a half to six-tenths of an inch in length. Their form is slender; the largest is only 12-100 of an inch in breadth at the base of the elytra. It may be called *stenocorus* (putator) *obscurus-brunneus*, *albido-pilosus*; *thorace inermi*; *elytris bidentatis*; *antennis longitudine corporis*, *articulis 2do and 3tio spinula terminatis*.

This insect is probably diffused over a large portion of the United States, perhaps from Maine to Georgia, wherever the oaks which it prefers are found.

As the leaves are in full vigour in July, preparing the descending sap, and as the greatest part of the new wood is formed after the summer solstice, the loss of leaves at this season must diminish the tree's increase in diameter in proportion to the quantity of leaves taken from it. But the falling of the branches with the larva in them enables us, though we cannot destroy the species, to check its ravages in some degree. The branches should be collected from the time they begin till they cease to fall, and carefully burnt.

The parts of the mouth which from the feeding apparatus are shewn at figure 1, where (a) represents the upper lip, a kind of scale which covers the mandibles on the upper side; this is slightly notched, dotted, and fringed with hairs. (b) Shews the form of the mandibles, the inner edge curved, without notches, having a little within the edge a curved line set with short, strong bristles. (c) The maxillæ, divided at the outer end, the exterior division the largest, thin and covered and fringed with hairs; the interior smaller, stronger, and terminated with thick set,

curved bristles, forming a stiff brush at the base of the outer division of the maxillary palpi of four joints, the terminal joint largest, obliquely truncated and compressed.

(d) The lower lip, deeply divided into two parts, thin, rounded at the ends, covered and fringed with hairs; at the base of these divisions are the two labial palpi of three joints, the terminal one of the same shape as in the other pair, but smaller. Figure 2, one of the antennæ magnified, to shew the 2d and 3d joints ending in a small spine. Figure 3, the oak-pruner nearly of the natural size. Figure 4, an end of one of the elytra, magnified, to shew the two points at the apex.

The plum-trees, *prunus domestica*, have for a number of years been disfigured with irregular swellings on the younger branches. The seat of this disease is in the bark. The sap is diverted from its regular course, and is absorbed entirely by the bark which is very much increased in thickness, the cuticle bursts, the swelling becomes irregular, and is formed into black lamps, with a cracked, uneven, granulated surface. The wood, besides being deprived of its nutriment, is very much compressed, and the branch above the tumour perishes. The cherry tree is affected in a similar manner.

When the Board of Trustees met at the seat of John Lowell, Esq. in Roxbury, on the 27th of June last, Mr. Pomroy took from a cherry-tree in Mr. Lowell's garden, a small branch diseased as above mentioned of the plum-tree. On taking off a thin slice of the tumour, I found it was inhabited by living larvæ; and flattered myself that the disease of both trees arose from the same insect. I brought the branch home with me, and placed it in a large glass phial. On the 6th of July I perceived that the larvæ had left the tumour, and were uneasy in the bottom of the phial. A vessel of earth was immediately prepared, as mentioned above in the account of the pruner; the larvæ when turned into it buried themselves instantly. On the

30th of the same month, or twenty-four days from their leaving the bark, the perfect insects began to rise. They proved to be insects which I had long known to occasion the fall of peaches, apricots, and plums, by the larva eating into the kernel of those fruits long before they had acquired half their growth.

This insect belongs to the same genus with the *rhynchænus strobi* or white pine weevil, described in the Massachusetts Agricultural Journal for January 1817, to a plate in which I would refer for a representation of the parts of the mouth. In that, the rostrum or snout is nearly strait; in the present species it is curved, so as to form the segment of a circle. All the thighs have two small obtuse points on the under side. In colour it is variegated with white and red hairs; the ground colour of the shelly coat on which they are placed is dark brown. The thorax is contracted behind the head; its surface is irregular, much pitted, and has a raised longitudinal line in the middle, with three small tubercles on each side of it, placed in a triangular form. The elytra are marked with longitudinal ridges, and on these are placed oblong tubercles, of which there are ten or twelve; four of these in the middle of the elytra are largest, smooth, and of a brown black colour. On the under side the body is pitted, or marked, with large impressed points, like the top of a thimble. The first pair of feet is rather the largest; the second the smallest, and all sprinkled with white and bright rust-coloured hairs. The points of the claws on all the feet are double. Figure 5, shews the natural size of the insect, and figure 6 magnified.

Mr. Pomroy was so obliging as to bring me three tumours cut from his plum-trees, later in the season, but the larvæ had left them. Being, therefore, uncertain whether the disease of the plum-tree is to be attributed to this insect or to another species of the same genus, I would call it the cherry weevil. It may be distinguished by the specific name of *rhynchænus (cerasi) femoribus dentatis; fulvo*

alboque variegatus, elytris tuberculis pluribus carinatis, quatuor in medio majoribus nigris.

Among the 272 species of this genus, mentioned by Fabricius, there were several found in Cayenne and Carolina, which are nearly allied to this ; but it differs from them all, and appears to be undescribed.

The evil produced by this insect cannot be wholly remedied ; but something may be done to diminish the mischief by cutting off the diseased branches. This however must be done at the right season, and must be the joint care of a whole neighbourhood at the same time. Those which furnished the data above set down, ceased to feed on the 6th of July, rose from the earth on the 30th, and were soon ready to deposite their eggs in healthy branches ; but if the diseased branches be cut off in the last half of June, a great number may be destroyed, and most effectually, by burning the amputated parts. It is possible, that in some situations they may be disclosed earlier ; it will therefore be surest to prune away the diseased parts as soon as they appear, cleansing the trees *now* of the old tumours, that new ones may be more readily perceived.

W. D. PECK.

Cambridge, Jan. 30, 1819.

Surry, Hancock County, Maine, Nov. 1st. 1818.

DEAR SIR,

IN compliance with your request, I now do myself the pleasure to communicate to you the result of an experiment of the effect of Plaster of Paris on the sea board. That you might more fully appreciate the advantage derived from the application of the Plaster, I shall give a short account of the ground on which it was sowed. In the spring of 1809 we broke up and planted with potatoes the

ground in question, which had been cleared of the first growth of timber about forty years since. It had grown up to white birches as large as a man's leg, when cut in 1802. The soil a clayey loam, from ten to twelve inches deep. the substratum a hard clay pan. The next year the same piece was laid down with wheat and herd's grass. We were induced to sow herd's grass, without clover from having observed that the clover rarely lasted more than one year, and was, as we supposed from the great luxuriance of its growth the first year, of disadvantage to the herd's grass the permanent grass. The event, however, did not justify our theory. The herd's grass not swarding the ground the first year it was overrun by a small green moss which often infests our mowing in this vicinity. Instead of cutting from two to three tons of hay to the acre, our usual crop the first year after laying down, when sowed with a mixture of clover, we cut only about a ton, and since then the crop has varied according to the season, from ten hundred to a ton, to the acre. The sixth of July 1817, I sowed a breadth a rod wide through this field with Plaster of Paris, at the rate of between four and five bushels to the acre. The field was mowed about the middle of August. The effect of the Plaster was then visible; the moss being nearly eradicated and the bottom covered with a fine mat of clover. This breadth continued to be distinguished during the fall and until the ground was covered with snow, by the superiority of its verdure. In consequence of this experiment we were induced to sow all our mowing with Plaster, part last fall and part this spring, excepting a breadth of equal width adjoining that sowed last year, which was reserved the better to note the difference. These two breadths were mowed about the middle of July, and the hay cut on a space of fourteen rods in length kept by itself. The result was four hundred of hay of a superior quality on the plastered, or at the rate of over two tons and one quarter to the acre, and but half that

quantity on the unplastered. To this experiment which establishes the comparative benefit of Plaster, not to be attributed to the fine season, I can also add, that on a piece sowed last year with wheat without manuring, and at the same time laid down with herd's-grass and clover, plastered this spring at the rate of three bushels to the acre. We have cut at two mowings over four tons to the acre, the clover being two feet high, and in blossom six weeks after the first mowing.

We have also sowed it to equal advantage on our pasture ground. I observed in the fifth vol. p. 64 of the *Agricultural Repository*, an account of an experiment made by you, relative to the cutting of potatoes for seed. The following is the result of a similar experiment made by us, which, as it is confirmatory of yours, I conceive almost conclusive.

84 hills planted each with one potatoe cut into three pieces, five and a half bushels.

84 hills planted each with one whole potatoe six bushels.

84 hills planted each with two whole potatoes, seven bushels.

The treatment in every other respect was exactly the same.

With great respect,

Your obd't servant,

CHARLES JARVIS.

Josiah Quincy, Esq.

AGRICULTURAL INTELLIGENCE

ONE of the most successful experiments in agriculture that we have ever known, is that of the Almshouse farm in Salem, which is under the superintendence of Mr. Paul Upton.

This farm consists of about thirty-five acres, as we are informed, and was two years since in a state of nature, and very rough land. It has been brought to, and the produce during the year 1818 was as follows:—

Pork killed, weight 7960 lbs.

Twelve live pigs sold for forty-two dollars.

On hand fifty-seven live pigs.

Corn 400 bushels.

Potatoes 2250 bushels.

Turnips 900 bushels.

Three tons of squashes.

Fifty tons pumpkins.

All the common summer vegetables for the Almshouse. We doubt whether any farm in the United States has produced more in proportion to its size, and it is a proof what well-directed industry can effect.

MASSACHUSETTS

AGRICULTURAL JOURNAL.

Vol. V.

JULY, 1819.

No. IV.

REMARKS ON THE AGRICULTURE OF MASSACHUSETTS. BY ONE OF THE TRUSTEES.

[The ensuing remarks were written, at the suggestion of the Board of Trustees, by one of its members. The chief design of the writer and of the publication is to bring under the consideration of the farming interest, a systematic course of husbandry, founded on the principle of regularity in the rotation of their crops. The system proposed is that, which in the present state of the habits of the farmers of Massachusetts, seems to the writer to be the best. It is not intended, however, to support authoritatively any particular theory of cultivation, or rotation. But our object principally is to lead the way to thought and discussion of the subject by practical men, and to collect and diffuse the results of general experience upon it. For which purpose their observations are solicited, and will have respectful notice in this Repository.]

SEC. I. ON THE GENERAL STATE OF AGRICULTURE IN MASSACHUSETTS.

IN considering the state of our agriculture, what first strikes the mind is the change, which time and circumstances are producing in the relations of our land and our industry. The population of Massachusetts Proper begins to feel the restriction, and to be affected by the laws of a limited territory. On an area of about six thousand square miles, we have, at this moment probably, a population of half a million;—or eighty to the square mile. A proportion a

little exceeding that of Scotland, estimated at seventy-five;—half that of France, estimated at one hundred and sixty; and one third that of England and the Netherlands, estimated at two hundred to the square mile. In a general survey our climate and soil may be considered of a medium character. With no intrinsic qualities, tending powerfully to deter, they have none strongly to attract settlement from other countries. Since the first ten years after the arrival of our ancestors, our state has comparatively gained nothing from the emigration of foreigners to it. On the contrary, it has, from that time, been a hive swarming for the benefit of other regions. The consequence has been, that, considering the actual basis of its population, its increase has been slow. Other states have been replenished by its vigour, while our own has augmented in a ratio so small, compared with the wonderful increase of other states, that it can be considered now, for half a century, scarcely more than stationary. The facility and cheapness, with which our population found that lands for settlement, in neighbouring states, might be obtained, have had a direct tendency to prevent the amelioration of our own. The sons of our farmers, with a few years of industry, could furnish themselves with means to purchase more land in the wilderness than their fathers owned, at a price, which made the purchase certainly valuable, and sufficiently near to their paternal residence to enable an occasional intercourse to be maintained between the sons and their family, during the first generation; and thus to render separation among relatives less painful.

It is plain, that, in this respect, the circumstances of Massachusetts Proper have undergone a change, which already has had great, and hereafter will have greater, effect on the condition of its agriculture. The circumstances, which heretofore tended to draw away our population into other states, are daily losing their force. The states, in our vicinity, are themselves becoming full. The

value of lands rise and bear a nearer proportion to the value of those in Massachusetts. The tide of emigration is attracted indeed by the circumstances of the land, far to the west. But the force of these attractions diminishes, in proportion to the distance at which it operates. They will probably never wholly cease, but must daily grow less efficient. Our population begins to increase in somewhat a greater ratio than formerly; and will probably hereafter continue to augment in a still greater. These new circumstances, in which our Commonwealth finds itself, are among the causes, which have occasioned that attention to agricultural pursuits, for which the present period is distinguished. Other causes of a more temporary and occasional character have co-operated in producing this effect; such are the embarrassments of our currency and the limitations of the field of commercial industry, resulting from a state of universal peace. But the most efficient and permanent are those, to which we have alluded, and arise from the fulness of our population, compared with the extent of our state; and from its now beginning to make itself practically perceived. What is true in Massachusetts, in this relation, is also true, in a greater or less degree, in every one of the old states of our union. Hence every where we perceive agricultural societies springing up; legislatures patronizing, intelligent men devoting themselves to the science, and an interest taken in its improvement, of a character more active and vigorous than this country ever before experienced. A new era in this art has apparently commenced. As it is the intention of the Trustees of the Massachusetts Agricultural Society, in the course of their publication, not only to communicate such particular facts, as experience and observation of practical men shall afford, but also to remark on the general state of agriculture, and to communicate such hints in relation to its amelioration as they deem most important either to be known or enforced, it has been thought that these general remarks on the state

of husbandry in Massachusetts would not be deemed irrelevant, and would be a natural introduction to some topics connected with the amelioration of our agriculture, which is the great purpose of our institution. In selecting these topics, we shall consider rather what is useful, than what is altogether novel. Certain leading topics must be treated, with greater or less repetition, in every successive number of our publication. The fundamental axioms of agriculture are not very numerous. But they are capable of an almost infinite variety of illustration. To make them understood, and show their applicability to the various species of soil in our country, and the different conditions of our husbandmen; so that a farmer with capital may not fear to enter upon their practice upon a considerable scale, and the farmer, with small capital, upon a scale conformable to his resources, is an important purpose of our society. In fulfilling this duty, we ought not to be deterred from placing the same topic in a great variety of lights, notwithstanding we may repeat some things, which before have been published, and may write many things, which are familiar to a great number. Our publications are intended to excite, as far as possible, universal attention to the subject of improving their agriculture among farmers. And this is better done by a persevering reiteration and illustration of old and known truths, than by a scrupulous research after novelties.

With these general impressions, we shall touch some topics, which we deem important for the farmers in Massachusetts, to consider, with more attention than they have been accustomed to bestow upon them.

SEC. 2. ON THE EXTENT OF LAND NECESSARY FOR A FARM, AND SUFFICIENT TO SUPPORT A FAMILY WELL, AND INDEPENDENTLY.

On this topic, perhaps the people of no country are so little practically instructed as ours. This arises from the

condition, in which the agricultural interest has been placed from the time of the first settlement of our country. Our ancestors found a wilderness, unoccupied except by savages. Those who fixed themselves in the country, when lands were cheap, naturally estimated their riches by the number, rather than by the productive power of their acres. Two, three, or four hundred acres were thought, at first, to be the extent of a location suitable for a farm. Afterwards, when, in the course of time, population became increased and lands divided, the ideas of farmers settled down to the opinion, that from eighty to one hundred and fifty acres, was about the number sufficient for an independent support of a family. Upon less than eighty acres, though a man might find ways and means to live, yet it was thought that he could hardly expect greatly to thrive. Accordingly the first effect of thriving among men of that size of farms, was generally evidenced by *the purchase of more land*, as the best criterion to themselves and assurance to their neighbours of their success in life. Often these purchases were made at the risk of embarrassment by debt, and almost always to the real injury of such farmers, whose surplus capital, or even their borrowed capital, would have been generally much better employed, in improving the lands they possessed, rather than in the purchase of more acres.

With respect to men possessing only thirty or forty acres, they scarcely ventured to call their possessions by the name of "a farm," so little is such an extent of land in general estimation, entitled to the use of that term. If they attempted to live and bring up a family upon them, they for the most part looked to other employment for their support. Turning mechanics, or hiring themselves out, at the most valuable season of the year, to their richer neighbours, or abandoning their own farms to tenants, and taking leases of farms, comprehending a greater extent of land, and so much better calculated to give that full employment to

their activity, which, to their mistaken apprehension, a farm of thirty or forty acres did not afford. Until of late years, opinions and conduct of this kind were almost universal. Even at this day, we know men, active, intelligent and industrious, possessed of this extent of land, who are labouring for others, or taking charge of their neighbours concerns, upon the avowed reason, that they cannot support their families upon thirty or forty acres! Yet their lands are good. The owners are industrious, intelligent, possessed of a strong desire of wealth and independence. But they do not realize the actual efficiency of the soil. Undoubtedly there are many honourable exceptions to the observation we are now about to make; as a general truth, however, it may be asserted, that **THE FARMERS OF MASSACHUSETTS ARE YET TO LEARN THE IMMENSE PRODUCTIVE POWER OF A PERFECTLY CULTIVATED ACRE.** Instead of seeking riches in augmenting the number of their acres, let them be sought in better modes of husbandry. As a general truth, we believe it may be asserted that every farmer in Massachusetts, possessed of one hundred acres of land, might divide them fairly, by quantity and quality, into thirds, and by a suitable cultivation, make either third more productive than his whole hundred acres are at present. This is the operation, at which those interested in the agriculture of Massachusetts, ought chiefly to aim—to make farmers realize what cultivation can effect, and to teach the modes, by which the productive power of the soil can best be elicited.

With respect to the productive power of a well cultivated acre, in addition to the many which have been stated in the former volumes of this publication, we shall cite the following, as placing the subject in as strong a light as is, perhaps, possible.

“The Androssan Farmer Society, in 1814, offered a silver medal for the best and heaviest crop of turnips in

the parish of Dundonald, situated in the west of Scotland ; and appointed two judges to inspect the different fields, cultivated within the bounds. They proceeded in the execution of their duty, and in compliance with the requisitions of the Society, by weighing a square rod taken from the average of the fields in different parts. The result of their investigation was, that on one farm, a Scotch acre, which is short of an acre and quarter English measure, produced in turnips—

	Tons	cwt.	lbs.
Of bulbs, without leaves, - - - -	76	0	0
Of leaves by themselves, - - - -	14	0	0
Total - - - - -	90	0	0

Forty bushels of Turnips are about equal to a ton ; and the quantity per acre, therefore, in bulbs alone, arise to the enormous amount of 3040 bushels, besides fourteen tons of leaves, of highly nutritive quality. Estimating the bulbs at thirty-three cents per bushel, *an acre will fetch upwards of one thousand dollars.* A sum sufficient to awaken the utmost agricultural industry. On another farm the same judges found

	Tons	cwt.	lbs.
The bulbs weighed, - - - - -	49	11	17
The leaves, - - - - -	17	5	51
Total, - - - - -	66	16	68

	Tons	cwt.	lbs.
On another they found that the bulbs weighed	48	7	16
The leaves, - - - - -	20	0	0
Total, - - - - -	68	7	16

As to the mode of cultivation nothing singular was stated. These quantities, though extraordinary, must not be supposed unprecedented ; for throughout all England and Scotland, an intelligent Englishman asserts, crops of

similar bulk and weight could be selected in every parish and county."*

George Adams, in his Treatise entitled "The New System of Husbandry," develops his mode of managing an acre, which, according to his statements and calculations, is equal, in result, to raising food enough in one season, on one acre, to keep one cow 1089 days, which is three years, wanting only six days!! We shall not vouch for the actual experiment, to the extent stated. His mode, however, is unquestionably excellent, and the product must be great, even should it considerably fall short of the amount he asserts.

His mode is this:—

His cattle are kept in houses in winter and summer, so contrived as to save both dung and urine. He plants in the fall, or as early as possible in the spring, drumhead cabbages, in rows, three feet wide in the rows, two feet between the plants; that is, three plants in every square yard. Thus an acre will contain 14520 plants. If the land be poor the plants ought to be nearer. On good land in the English climate, they ought to weigh fifteen pounds each, upon an average, by the first of June. This is equal to 217,000 pounds, or one hundred and eight tons to the acre. He allows each beast thirteen cabbages and 1-4th or 200 lbs., for every day and night. The product of this acre, then, will keep twenty head of cattle fifty four days; or one head, one thousand and eighty-nine days—nearly three years.

Adams' system is connected with soiling cattle, or keeping them in houses during the whole summer, and is capable of still farther extension. For he states his practice to be carefully to cut off the cabbages by the head, leaving their stalks cut across at the top, to grow again.

* See the writings of Agricola in the Acadian Recorder, No. 18.

As soon as a few rows are cleared off, he spreads the dung and urine carefully over the ground. The cabbage stalk, being left, will soon sprout again. Then with a small hoe he cuts the ground over, so as to cover the manure, and sows turnips among the cabbage stalks. He continues to do this until the whole ground is gone over. He asserts that, in that climate, by the first of November he has as great a product, as at first.

In this way, land is improved by bearing crops, and one acre of land made to keep twenty horned cattle 108 days, or three and a half months ! !

Without vouching for the result of this experiment, in the extent here specified, it is simple and practicable enough to enable any one to satisfy himself of the greatness of its product, and must have a strong tendency to awaken the attention of practical farmers to the subject.

A question is sometimes asked, whether it be possible to obtain similar results, in Massachusetts. Our answer is, that to the extent such a result is attainable any where, it is attainable in Massachusetts. At least, there is nothing in the qualities of our soil, to prevent, and little difference in our climate, to make any material variance in result. Our intelligence and industry are not inferior to those of Europe. But the truth is, that we have not yet had our attention long enough directed to the subject, to become practically familiar with these modes of husbandry. Above all, our farmers being accustomed to disperse their attention over a great surface, and to attend to a variety of objects, and for the most part wanting the capital to be applied to high cultivation, or ignorant of the mode of applying it, either do not commence the cultivation, to which we refer, right, or do not prosecute it, for a series of years, systematically. Hitherto, there has been little intercourse of mind and interchange of experiments on agricultural subjects. This state of things is, however, now daily changing; and from the general attention paid to the subject, and

the intelligence engaged in it, there can be no doubt, that in a few years important effects will be produced on our agriculture.

In the mean time let small farmers in Massachusetts inquire. They will find that, in Europe, men possessed of thirty or forty acres of good arable land, are thought rich; that they often keep fifteen or twenty head of cattle; raise food proportionable to such an amount of stock; and support themselves and their families well and independently.

SEC. III. ON THE CULTIVATION OF ROOTS.

As a general principle, it may be asserted, we believe with truth, that the only basis of great success in agriculture, in a state of soil and condition of society, like that existing in Massachusetts, is *the field culture of roots*. Whether the vegetable selected be the turnip, or parsnip, or carrot, or cabbage, or potatoe, or any other of similar character, it perhaps is of little importance; but that one or other of them should enter into the regular rotation of our husbandry, is essential to its great prosperity. The want of this practice is the great defect of our agriculture. The practice of raising roots for family use, or for the market, is, indeed, common enough. But what is here meant, is the raising them for the consumption of stock, and as the principal dependence of the farmer for its winter support. This subject has frequently been discussed in former publications of this Society. It cannot, however, be pressed upon the consideration of our farmers too frequently, or too urgently.

The connexion of root cultivation with a prosperous agriculture is not a recent discovery, although it is the great boast of the farming interest of England and Scotland. More than fifty years ago, a Dutch farmer asserted to Joseph Marshall, an intelligent Englishman, at that time travelling through the northern kingdoms of Europe, for agricultural information, "that the foundation of all good agriculture was the raising roots, as the winter food for

cattle.”* The reason is obvious. By this system the greatest quantity of food is raised upon the smallest extent of land, with the least labour. What other cultivation can enable a farmer to raise fifty, sixty, and even one hundred tons of food, of an excellent quality, upon a single acre? There is none, in point of product, that can pretend to compare with it. In a country and in a state of population, like that in Massachusetts, the importance of this system cannot be too highly estimated. Owing to the state of our population, lands, compared with their quality, are high. Farmers must learn, in such a country, to do with little land. That cultivation ought, therefore, to prevail, which enables them to produce the greatest quantities of food on the least extent of soil. Again, the lands in Massachusetts, considered in the aggregate, cannot be estimated at more than of a medium character, in point of fertility. What do farmers on such lands require? Manures. How are these to be obtained in the interior of such a country; and the greater number of farmers are always in the interior? There can be but one answer to this question. By cattle. I say nothing of plaster of Paris. The use of this mineral forms an anomaly in the principles of agriculture, and where its utility is ascertained, may be made the basis of a system of agriculture altogether peculiar. But, generally speaking, a rich agricultural country must be a cattle raising country. Now a country, which is, in a manner, winter seven months in the year, can by no possibility become a great cattle raising country, unless it make great provision for their support during the rigours of that season. This can alone be done, upon a great scale, by roots. By appropriating a few acres of his best lands to their cultivation, the Massachusetts farmer will be enabled to increase in a proportionate degree his stock of cattle. Instead of understocking his pasture ground, as is the case in most parts of the country, through fear of not being able to

* See *Travels through the Northern kingdoms*. By Joseph Marshall, in 1763, 1769, and 1770. Vol. I. p. 214.

maintain his summer stock on his winter food, this system enables the farmer to stock his pastures up to their full power. He has only to calculate what number of cattle his pastures can keep well during the summer, and raise such a quantity of roots, as, with his hay, will keep such number of cattle through the winter. This system is capable of much greater development. But, in its first attempts, it can most safely be limited to the purpose we have named, that of enabling the farmer to stock his lands up to their full pasture power. After practice has made him familiar with the system, it will be succeeded by the easiest and most economical of all modes of raising cattle, that of soiling them, as it is technically called; or keeping them under roofs all the year round, and feeding them, during the summer months, with green vegetable substances, cut and delivered to them daily. The Trustees of the Massachusetts Agricultural Society have taken some steps towards obtaining an experiment upon this system, on a scale sufficiently extensive to make its utility apparent, should such be the result; and also calculated to illustrate the mode of performing it, in the climate and on the soil of Massachusetts. This they expect to be able to communicate in some future number. In the present state of knowledge and experiment, it is not contemplated to recommend to farmers a system so novel, and apparently so dubious, as that of soiling. It is only meant here to suggest, that a high state of agriculture must probably eventuate in the adoption of it; at least, on very many farms in Massachusetts. The system of raising roots by field culture, for the purpose of the winter food of stock, is independent of that soiling, and solely dependent upon the fact, that in this way, a very great, perhaps the greatest possible quantity of food, can be raised with little comparative labour, on a very small extent of land; and that food for the support of stock, in winter, is essential to the success of any extensive plan of husbandry, in such a climate as that of Massachusetts.

SEC. IV. ON THE ROOTS BEST SUITED FOR FIELD CULTURE.

TURE.

Considering root cultivation as the best basis, on which to place the hopes of a prosperous agriculture in Massachusetts, our next remarks naturally are directed to the vegetable, which ought to be selected for this purpose. The practice of farmers, in other countries, has terminated in the preference of either the carrot, the turnip, or the potatoe. Other vegetables, such as the parsnip, the beet, and the cabbage, have had the approbation of particular individual agriculturalists. But we apprehend, that the three first are favoured by the greater number of farmers. Of these, the turnip has, in other countries, been most generally approved, and the benefits of the potatoe most frequently been controverted. It is not our intention to enter into the discussion of the merits of either. As far as our experience extends, each will amply reward the industry and skill of the cultivator; and there are reasons why all should be cultivated in some proportions, on every farm, conducted on the basis we recommend. The quality of his soil ought perhaps to decide each individual in making his selection. Every thing else being equal, we consider that bushel for bushel, the carrot is superior as a winter food for cattle to the potatoe; and perhaps the Swedish turnip is superior to either. This we know is controverted by some, and the degree and ground of preference have been made the subject of distinct experiments, with various results. Our Massachusetts modes of agriculture in relation to both may be improved. But according to our experience, a greater quantity of either carrots, or turnips, than of potatoes, may be raised on the same ground, for equal labour. That is to say, four or five hundred bushels of either may be raised at an expense of labour and land, which would not raise two hundred bushels of potatoes. This depends, however, upon the manner, in which those crops are managed. Both may be made costly crops,

unless the mode of field management be well understood; and when this is the case, they can scarcely fail to be very profitable. The sort of comparison, which has been instituted in relation to the different values, as a productive food, of these three vegetables, is, however, in our opinion, a matter rather curious than useful; inasmuch as each ought to enter into any extensive scheme of agriculture, having for its basis the cultivation of roots. The reason is, that this system requires a regular rotation of crops; that is, that one crop should successively follow the other: so that, at the end of a certain number of years, after the determined series shall have been gone through, the same crops return in relation to each other, in the same order. A right rotation of crops being then an essential part of that system of agriculture which we advocate, we shall recur very shortly to this topic.

SEC. V. ON A ROTATION OF CROPS BEST SUITED TO A
SYSTEMATIC AGRICULTURE, HAVING FOR ITS BASIS
THE FIELD CULTURE OF ROOTS.

In treating this topic, we shall not trouble ourselves with discussing what is abstractedly the best, in all times, or in all places. Our business is to elucidate what is best suited to the agriculture of Massachusetts. And in determining this, great respect ought to be had to the prevailing customs of its husbandry, and the existing state of knowledge among the mass of the farmers of the state. We think, therefore, that the system of rotation to be recommended ought to be simple, and, as far as possible, conformable to the present practices of our farmers; at least in every thing, not contravening the essential principles of the system we advocate. Let us suppose, then, that a farmer's land is in the sward, and that it is proposed to put his farm into a course of management for the raising vegetables, for the consumption of his stock; the question is, what rotation shall be adopted? To this we answer, that if, from any

circumstance of convenience or calculation, such farmer prefers to commence his rotation of crops with any species of roots, none is preferable to the potatoe. This therefore ought to precede, in our opinion, all others, not only because, as far as we have had any experience, it is the best of all breaking up crops, as they are called, but also because the farmers of Massachusetts are so well acquainted with its nature and management. The reason why the potatoe ought to lead in the series of root cultivation, is, that it is productive with manures when they are in a crude and strawy state; that, when properly cultivated, it deepens and pulverizes the soil, and leaves it clean and friable. It is, therefore, an admirable preparative for other vegetables, particularly for the carrot and turnip. It will be observed, that we have recommended the potatoe to lead in the rotation, only conditionally. The reason is, that we are satisfied that the common practice of making the potatoe a breaking up crop, is not the most advisable. It appears to us best, all things considered, that the first crop after turning over the sward, should be oats; sown at the rate of four or five bushels to the acre, well harrowed and rolled, and cut in the milk for fodder. That this is a productive process, is familiar to our farmers: it being a common practice, we believe, in all parts of the state; it certainly is in the vicinity of our capital, with some of the best practical husbandmen. It is certain that this cultivation pays for rent and labour. The reason, why we think it ought to be the first step in all rotations, in Massachusetts, is, that its tendency is to enable the subsequent cultivations to produce their best effect upon the general condition of the soil; a circumstance not sufficiently considered by the Massachusetts farmer; who is too apt to have an exclusive eye to the product of the present year, without regarding sufficiently the effect upon the general state of his land. We think, therefore, that oats sown for fodder, on the inverted sward, should be the first step in a

good rotation. And we should be of this opinion, even could it be shewn, which we think it cannot, that the product of the potatoe would be greater, first after turning the sward, than when it follows the oat crop. The reverse we know to be the case. We make, however, this observation, because we know practical farmers, who have a contrary belief, and who think that both the potatoe and Indian corn produce more after the first turning of the sward, than when following any other crop whatever. This opinion, might, we think, be easily shown to have its origin in a defective course of agriculture. We may make some remarks on this subject hereafter. It is at present sufficient for our purpose to notice it in passing. The reason, why an oat crop should precede the potatoe crop in the rotation we recommend, is, that it not only pays well by its product for the year's labour, but chiefly because it enables the husbandman to deepen his ploughing, preparatory to the second year's series in the rotation; that is, to the potatoe crop. Every facility ought to be given to the Massachusetts husbandman, to encourage and enable him to plough deep, whatever be the soil. We will not say there is no exception to this rule. But we believe it is as true as is any general proposition. One of the great defects of the Massachusetts agriculture is, the inclination among farmers to shallow ploughing. A contrary opinion begins to gain ground among the most judicious. But, with many, four or five inches depth is still thought sufficient. They deem it a great evil "to turn up the red earth." It is not our intention to give the reasons, which favour deep ploughing. They are so numerous, are so universally stated by all writers, are so consonant to reason, and begin so generally to be understood, that we do not think it necessary to make any statement on the subject. We take it for granted, on the present occasion, as a settled and acknowledged principle of agriculture, that the deeper the tilth the better the husbandry, and of con-

sequence the more productive. We think, however, it is important to make some remarks on the manner, in which this depth of soil is to be attained ; and the more, because we know some who have committed great errors, and young beginners particularly are apt to fall into an injurious course of ploughing in this respect. We knew a gentleman of this class, who, being convinced of the importance of deep ploughing, and desirous at once to realize the advantage of it, adopted this course ; certainly a very natural one. He began his farming by breaking up his sward land, with three yoke of cattle and a Dutch plough, running a furrow eleven or twelve inches in depth, and as wide as deep. The consequence was, all the "red" or unproductive earth, was on the top, and all the good soil at the bottom. He planted his potatoes with the usual quantity of manure, and in the usual manner. His product however was indifferent ; and after a great expense he was astonished in autumn, that after such deep ploughing his crop was not very superior. The reason undoubtedly was, that the red or unproductive earth bore too great a proportion in the whole ploughed soil ; it was turned over in too great masses ; and although the general state of the soil was unquestionably ameliorated by the operation, yet he made too great a sacrifice for this general good, in the smallness of the first year's crop, in comparison with the cultivation. The great study of our farmers ought to be to deepen their soil, but this ought always to be effected gradually, and without a sacrifice of any one year's productiveness. This can be done only by a judicious rotation. And it is with this reference, that we are of opinion that oats sown and cut for fodder, are best made the first link in a judicious system of rotation.

The first ploughing of sward land should always be as shallow as is consistent with turning the sod over well. And this for two reasons. 1. Because the thinner the furrow slice, the nearer the harrow is brought in contact

with the roots of the inverted grass, of course it does its work of destroying them more perfectly. 2d. Because the work is done with a less force of team, than when a greater depth is attempted in breaking up sward land.

The rotation, then, which, with reference to the general state of agriculture in Massachusetts, is deemed best, is a six years' rotation.

1st year. After breaking up the sward is oats sown, thick, to be cut for fodder.

2d year. Potatoes or Indian corn, or both.

3d year. Carrots or turnips, or both.

4th year. Barley or wheat, sown with clover and herds' grass, or red top.

5th year. Clover mowed.

6th year. Herds'-grass and clover.

In the autumn of the sixth year, the land to be broken up, and on the seventh year the same rotation recommences.

We prefer this course and limitation of rotations, for our Massachusetts agriculture, to any other.

1. Because it varies so little from the present course of our general husbandry. The only important differences consist in three particulars;—in making oats, cut for fodder, invariably to precede potatoes or Indian corn; in making these to be invariably succeeded by carrots or turnips; and in ploughing up the land invariably at the end of the sixth year.

2d. Because it makes deep ploughing easy, by facilitating the plough on the second year, by the effect of the oat crop upon the soil; for not only the texture of the grass-roots is destroyed by the ploughing for the oat-crop, but the tendency of the oat is to pulverize the soil by the expansion of its roots while growing, perhaps more than any other grain.

3d. Because an adherence to the specified rotation, requires that our farmers should plough up their land, at

least once in six years, instead of the uncertain method usually prevalent, in which little or no regularity is adopted. Each piece is broken up in turn, as temporary expediency dictates, in which every thing is sacrificed to the passing year's expectation of product. Whereas a systematic agriculture proceeds upon the principle of a gradual amelioration of the whole farm, by a systematic course of cultivation. Thus making every acre, if possible, equally productive, instead of exhausting by a course of constant cropping, a few favourite pieces. In other words, the effect of regular rotation in husbandry is to improve the worst acres, and to favour, by not annually exhausting, the best. Whereas the effect of an irregular course of husbandry, dependant upon the exercise of the annual judgment, or caprice of the farmer, is precisely the reverse; to deteriorate the best parts of a farm, and not to improve the worst.

We shall farther attempt to illustrate the benefit of such rotation, by remarking upon each year's annual crop, in the proposed succession.

SEC. VI. OF THE FIRST YEAR IN THE ROTATION—OATS SOWN FOR FODDER.

This cultivation we recommend for the reasons before stated, and also because no grain thrives better on an inverted sward than the oat, or less exhausts the soil. Those, however, who prefer to commence a rotation of crops, by the potatoe, thereby reducing it to a succession of five, instead of six years, may do it without affecting essentially the advantage of the system. However, the benefits resulting from commencing the first with oats, rather than with the potatoe, deserves a little farther illustration.

The great object which a farmer, entering upon a systematic course of husbandry, should contemplate as essential to its success, is *the manuring well*, once in six years,

all the land he subjects to rotation. Now, in manuring well, three things are included:—the manuring sufficiently; the manuring equally; the manuring deeply. If the rotation commence with the potatoe, and this be put into the ground the first year after the sward is inverted, it is next to impossible to put the manure into the ground so deep and so equally as it can be, when, in consequence of the oat-crop, the land is submitted to the plough, free of sod, and the cohesion of sward thus dissolved. In putting manure upon land for potatoes, first after the inverted sward, the manure is always put near the surface. It cannot be covered with the plough, in the usual rough way of planting the potatoe; and the consequence is, that for covering the potatoe and the manure, the hoe is almost wholly depended upon, and the work is done by scraping the earth, and heaping it up in hills. Of all modes this is the most expensive, and the least beneficial to the land. What the farmer wants, in order to attain a great product, is to make a great and a deep bed, for the roots of his crop to shoot and expand. Now, hoeing is in fact little better than scratching the land, compared with the great surface moved by a plough when it runs, unobstructed by the sward. To enable the plough to do its work well, when preparing for potatoes, we therefore deem that oats ought to precede them. Why it is so will be apparent, when, in our next section, we treat of the potatoe cultivation.

With respect to the oat we prefer it should be cut in the milk, as it is called, to be used for fodder, than to let it ripen for grain. By cutting in the milk, the land is not exhausted by the plant, since it is found that in forming the seed of plants, the greatest exhaustion of the ground is occasioned. However, if the farmer choose to ripen his oats, this circumstance is of no material importance, in relation to the system of rotation. We think it generally best, and, in the vicinity of the capital of Massachusetts, it is certainly more profitable to cut in the milk.

SEC. VII. OF THE SECOND YEAR IN THE ROTATION—
THE POTATOE OR INDIAN CORN.

In a system of regular rotation, the second year may be devoted to potatoes or Indian corn. We mention the last, not because we deem it, as usually managed, a profitable cultivation, but because no system is likely to be easily made popular in Massachusetts, from which Indian corn is absolutely excluded, or in which a place is not provided for it. It may be substituted for potatoes; or, the land subject to the rotation of the second year, may be divided between them. They each bear a relation to both the antecedent and subsequent crops in the proposed rotation, not very dissimilar; both follow oats, and precede carrots, well and profitably; both ought to be managed, so far as respects the soil, in the same manner; and both leave the soil, as it respects tilth, in a state not very dissimilar. So far, however, as the exhaustion of the land is a circumstance of weight, the general opinion is undoubtedly true, that the potatoe exhausts much less, and its cultivation ameliorates the soil much more, than Indian corn. And for this reason we give it the preference, in the system of rotation.

With respect to the cultivation of the potatoe, it may be thought presumption to pretend to suggest any thing new to the Massachusetts farmer, upon the subject. If, however, they would reap the full benefit from a rotation of crops, which the system proposes, they must, in some respects, change the mode most generally in use. We refer to the practice almost universal, of cultivating the potatoe in hills, with the hoe—and with a quantity of manure, adapted merely to the imagined exigency of a medium crop.

In these three respects the common practice ought to be abandoned. We shall not meddle with the question, whether more potatoes can be raised in hills, or in rows.

Although we have no doubt the last method is by far the most productive, could the reverse be proved, which, satisfactorily, it cannot, a very considerable benefit in the crop, in favour of the hill culture, would scarcely be sufficient to balance the other disadvantages of the practice.

By cultivating in hills, the manure is deposited in spots, all over the ground; and of course, far less equally distributed than when deposited in rows. But the great objection to the system of the culture of potatoes, in hills, is, that it almost makes unavoidable the use of the hoe—an instrument, which is in every country expensive where man's labour is high, and of course most expensive of all, in a country where it is higher than in any other. By the row-culture the use of the hoe may be almost, if not altogether, excluded. And this circumstance gives it a decided preference.

The culture of potatoes in rows, almost necessarily leads to the use of more manure than is practised in the hill culture; indeed this is inevitable, if the rows be, as we think they ought to be, not more than two feet and a half from each other. A circumstance, beyond all others, beneficial.

We know that a contrary practice is advocated by some distinguished experimental farmers, who say that at three and even four feet, by reason of the facility with which the crop is, in its after culture, ploughed and weeded, a greater product may be attained. This is possible, although we think not likely, but if it were, the reason, just given, in relation to the preference of the row culture over the hill culture of potatoes, is equally conclusive. The great object of the farmer ought not to be, abstractedly, to raise the greatest crop possible in a single year; but to raise the greatest crop possible consistent with the highest amelioration of the soil. The same reason is as strong against cultivation of the potatoe, in wide rows, as in hills; the manure is placed at too great a distance, and it is scarcely practicable, by any general after ploughing, to spread it

equally over the surface ; the succeeding crop comes up in bunches, or in rows. Whereas, when the rows are only two feet and a half from each other, an autumn cross ploughing, followed by a general spring ploughing and harrowing the ensuing year, preparatory to the carrot cultivation, equalizes all the manure ; and leaves it spread the most beneficially, not only for the carrot crop, but which is more important than all, for the three years destined to barley, clover, and herds' grass. If any one prefer, however, rows at the distance of three feet, he can adopt it without any material disadvantage to the success of the general system.

It will be expected, and it is proper that something should be said on the mode of potatoe cultivation, which we deem most to be preferred. If, to many, there be nothing new in the suggestions we shall make, let it be remembered, that we did not propose to ourselves to collect novelties, but to press useful truths upon the general attention of farmers.

Supposing, then, that oats cut in the milk have preceded the potatoe, as we have suggested, good husbandry requires that the oat stubble should be turned under by a general ploughing of the whole, as soon as possible after the oats are taken from the land. This ploughing is very likely to be neglected or postponed, owing to the many calls on the farmers attention, at the time of the oat fodder harvest. Yet it is very important that this ploughing should be performed as early as possible. Not only because of the general advantage to the ground, resulting from all ploughing, but also from the longer time thus given for the roots of the oat to decay, and so become manure ; and above all, from the destruction of weeds, and preventing them from filling the ground with seeds. The neglect or delay of autumn ploughings is a great defect in the general husbandry of Massachusetts. In good farming, the attention to the destruction of weeds, preparatory to sowing the crop, is quite as useful as subsequent to it. The one will some-

times render the other unnecessary, and always greatly diminishes the labour and expense of that operation. If after this summer's ploughing, other business of the farm will permit, it is an excellent practice to throw the whole into ridges, by furrowing and back-furrowing alternately, or, which is better, with a double mould plough. In this way, the surface is exposed to the action of the frost; and the great process of husbandry, deepening and pulverizing the soil, carried on cheaply and efficaciously.

In this state, the land should lie until the spring, when the ridges should be split, and the land harrowed level. A deep and general ploughing should then be given, and the land again harrowed level. At this spring ploughing of the second year of the rotation, is the time for commencing the deepening of the soil. By the ploughings for the oat crop, and the subsequent autumn ploughing and ridging, the upper stratum will have been well pulverized, and all the texture of the grass roots broken. The plough has now got the second stratum at advantage. The first stratum may be considered as four inches. The second stratum as four inches more. This spring, ploughing of the second year of rotation ought, therefore, to be at least eight inches. Deeper would be advantageous. But in a systematic culture, this is sufficient:—1st. Because the carrot cultivation, in the third year, is calculated to finish the whole depth of the necessary ploughing, by deepening the bed to twelve inches. 2d. Because, although a greater depth than eight inches would be desirable, even for potatoes, yet a greater depth than eight inches, in the generality of our land, cannot be penetrated, at the commencement of such a system, by a force of team not exceeding one yoke of oxen. And as it is one object of systematic culture to diminish the expense of ploughing, we shall show, in the course of these remarks, that on a farm subjected to the rotation system, no force of team ought to be used, after one rotation is completed, greater than one yoke of oxen and one driver, for any ploughing.

We suppose, then, the first spring ploughing for the second year of rotation (the year for potatoes) completed, to the depth of eight inches, and the whole well harrowed level. The next step in the process is with a double mould board plough, to open the furrows, at a distance from each other, of either two feet and a half or three; at the election of the farmer. If he have no double mould board plough, then the common plough will produce the same effect, less conveniently, however, by furrowing and back furrowing. However, a double mould plough is so useful an instrument, that it cannot be too highly recommended. The English and Scotch ploughs of this kind are made with sheet iron mould boards, and with hinges and hooks, so as that the trench opened by the plough may be made wider, or narrower, at the pleasure of the workman. These ploughs are easily to be obtained from England, Scotland, or New York. They are of such great use, that it would be well worth the exertion of two or three farmers, in every vicinity, to join and procure one, in common. Their cost does not greatly exceed that of a good common plough. There is no particular skill requisite in the use of this plough. It ought only always to be remembered, that its purpose is not to deepen the soil, but to open a trench in it to the depth already attained by the previous ploughings. Below which, this plough is not intended to reach.

The land being thus thrown into furrows at two and a half, or at most, three feet distance, the next step in the process is the carting out, and distributing the manure.

In doing this it must be remembered, that the carts ought to enter at the end of the furrows, so that the ridges should not be beaten down by the wheels, or by the oxen crossing over them. And for this purpose, the preceding process of throwing the land into furrows must not be done all at once; but after three, or, at most, five furrows are made, the manure is to be carted and spread in the furrows, as above directed; being careful to fill the trenches

sufficiently, and that all the manure is below the level of the ridges. As soon as these three, or five furrows are sufficiently filled with manure, the potatoes, if they are cut, ought to be dropped at eight inches distance. If they are whole, then at twelve inches distance. The potatoes are thus placed on the top of the manure. But it will be best if the dropper presses each piece, or potatoe a little into the manure, with his hand or his heel. After these three, or five rows are thus planted, and manured, the ridges are split by the double mould board plough, and the potatoe and manure are thus completely and sufficiently covered, without the use of the hoe. This finishes the process of planting the potatoe. After the three, or five first rows are completed, three or five more furrows are to be opened and treated in the same manner, until the whole piece is finished.

To the performing this part of the process well and most economically, two or three things must be attended to:—1st. It is a great saving of time and labour, if the manure shall have been previously, (say in the winter season,) carted upon the land. The location of the manure heap is also a subject of some attention. It must not be in the centre of the land, but, at the end of the place destined for the termination of the furrows, or drills. So that the carts, when going from the heap, shall always enter into the ends of the drills. It being important in this husbandry, that the carts should cross the ridges as little as possible. 2d. The potatoes ought to be cut, also, in the winter season, and kept, one or two months, in heaps in the cellar. The work is thus done, at leisure, and the best potatoes selected for seed. It is thought also, by practical farmers, that it is best that the wound produced by cutting the potatoe, should be dried by laying some time in the cellar, previously to its being put into the ground. At any rate it is no disadvantage; and cutting potatoes is good work for stormy and winter weather.

We have said, that the proximity of the drills or furrows, in the culture, was "beyond all other circumstances beneficial, from its rendering unavoidable the use of more manure than is commonly applied." The custom of manuring a great deal of land very slightly, instead of a much smaller quantity very well, is the great error of Massachusetts farming, and is probably the reason of the difference between our crops and those common in the well cultivated parts of Europe. Ten or fifteen loads of common barn manure is thought to be sufficient for an acre. Whereas there ought never to be less than thirty loads, and good cultivation is scarcely satisfied with less than forty to the acre.

The generality of Massachusetts farmers will, we know, think that even thirty loads to the acre is enormous. But let them remember, that the system we recommend requires only that one sixth part of the arable land should be manured every six years; and that the manuring now given, is to serve for the potatoe, the carrot, the barley, the clover, and the herds'-grass crop. Whatever is worth doing at all, is worth doing well. It is better to put a few acres in a state of high tilth and improvement, than to put a great many in a state only a little better than deterioration.

In relation to the after culture, some very important processes ought to be attended to, which are generally altogether neglected by the Massachusetts farmers. The land having been thrown into ridges, two and a half feet distance from each other, and about one foot high; under which ridges, the manure and the seed for the ensuing crops of potatoes having been deposited; in this state they should be allowed to remain, for ten or twelve days, that is *until just before the potatoes begin to shoot above the ground*. They are, from time to time, to be examined to see when they have risen to a few inches below the surface. At this time, before they are out of the ground, the harrow should be

passed over the ridges lengthways ; or if it be feared, that the length of the harrow teeth should injure the new shoots, then the ridges may be harrowed flat with the back of the harrow. The object is to kill the weeds, which have grown, or began to root themselves, since the planting. The potatoes will now come up on a clean bed. As soon as they appear, and the line of the crop is distinctly to be seen, a double mould plough, or, if this be wanting, a single one, should be run through the furrows, throwing the earth to the crop. This in land, in which weeds are not luxuriant, is often sufficient. If, however, weeds appear among the shoots in the rows, the hoe may be used lightly, for the purpose of eradicating them, and evening the tops of the rows. If, however, as the plants advance, the judgment of the farmer deem it best, it will be advantageous to give the plants a second earthing up, which will complete the work.

A farmer may reasonably calculate, after a planting of potatoes thus managed, averaging one year with another, at least two hundred bushels to the acre ; and if general circumstances favour, three hundred ; possibly a much greater quantity.

Much indeed will depend upon the general state of the land and the season. But the greatness of this average, compared with the usual average product of an acre of potatoes in Massachusetts, depends upon the greater quantity of seed, and the greater quantity of manure, which, to this course of husbandry is indispensable. Where the rows are only two and a half feet from each other, it takes not less than twenty-five bushels of seed. When they are at three feet distance, somewhat more than twenty. As to manure, from thirty to forty load, is the least that ought to be permitted. For on this system of rotation, the products of five years, including the year of potatoes, depends upon the heart, into which the land is put in this, the second year. By "loads," we here understand buck loads, as they are called in the

vicinity of Boston. That is, as much as one yoke of oxen can well draw on ploughed land.

A few words will suffice on the mode of harvesting the potatoe crop. The common mode of taking them up with the hoe is expensive. That of leaving the tops upon the ground sloventy; and where the intention is, that a carrot crop should follow, is apt to be injurious. Because the carrot, in its first stages of growth, is an extremely small and delicate plant. And if the potatoe tops of the preceding year be left on the ground, all those fibres which have not decayed, are apt, in the course of the hoeing and ploughing the carrot, to clog the instrument, and thus draw out a part of the carrot plants. Now it is a principle of the rotation system, indeed of all good farming, that the mode of managing the crop of each year, should not only be best for that crop, but also best for all that succeeds. In harvesting the potatoe, therefore, reference ought to be had to the carrot crop, which is to succeed. For this purpose the first process of harvesting the potatoe crop, ought to be, pulling the vines; and after taking off the potatoes, which adhere, throwing the vines into a cart, to be passed down the rows, carrying them off to the barn yard and hog pens. This mode is recommended as the first step, because, as the mode of uncovering the potatoe is by the plough; if the vines be not previously taken off the ground, a great part will be buried, or get intermixed with the soil, and the parts which do not decay will certainly interfere with the succeeding crop. This process concluded, a double mould board plough should be passed through the centre of the ridge, at the depth of the potatoe bed. The great mass of the potatoes will be found in the furrow, or be seen on the edge of each side of it. Not a hoe should be permitted on the field. The pickers should follow the plough, throwing the potatoes into baskets and thence into carts. As soon as the furrows are cleared of the potatoes, which are exposed to the eye, a harrow

should be passed also lengthways the furrow. This disengages the residue. The pickers again follow. Very few, if any, will remain after these two processes. If any should, they will be all easily gathered by a boy passing over the field, and following the plough when the land is thrown into ridges, which is the last process in the autumn of the potatoe year; that is, of the second year in the rotation.

The potatoe crop being harvested, it is now the time to give the land its last deepening, by a general ploughing, going to the depth of eleven or twelve inches. This is now done easily, the potatoe cultivation, and particularly the ploughing and harrowing accompanying the harvesting the potatoes, having brought the land to a state to be easily penetrated by the plough, with one yoke of oxen, to the desired depth.

After this general ploughing, the land should be thrown into ridges, as high as possible. This again exposes the land to the action of the winter's frost, the advantages of which have before been intimated. Thus finishes the labours of the potatoe year, or the second in the proposed rotation.

SEC. VIII. OF THE THIRD YEAR IN THE ROTATION— THE CARROT AND THE SWEDISH TURNIP YEAR.

In good farming, and on the proposed rotation, both these vegetables ought to occupy the third year. That is, both ought to be cultivated in such proportions as each farmer shall judge best. But, with one or the other, or with both, the land subjected to the rotation ought to be filled. The reason is, that they are unquestionably as valuable as any roots. The cultivation of each coincides with that of the other. If rightly managed, neither the sowing nor the culture of either, will interfere with that of the other. In their expenditure, also, the carrot is most excellent as a food in the winter, and the Swedish turnip, in the spring

and early summer. The farmer ought, therefore, systematically to provide himself with a store of both, so that his cattle may not want succulent food until the grass returns.

The land, subjected to the rotation has been, by the cultivation of the first and second years, brought into a condition the best possible for both species of roots. It is pulverized, it is weeded, it is deepened in soil, it is enriched. The labour of the third year is, also, greatly lessened and facilitated. Its course is as follows :

As early as possible, after the frost is out of the land, and after it is sufficiently dry for cultivation, let the ridges be split, and the land harrowed level. A general ploughing should then be given to it. The part destined for carrots should now be thrown into ridges, at about two feet distance from each other, in the manner before stated in the last section. The rows may be nearer, even to the distance of twelve or fourteen inches. But in the commencement of this cultivation, by any farmer, it is best to take land enough between the rows. For when a farmer first commences this culture, upon a considerable scale in the field, he is apt to be alarmed at the labour of hoeing and weeding such an extent of vegetables, and to be deterred from prosecuting it. Unless, therefore, he does every thing to facilitate the operation of weeding in the first year of the attempt, the hand labour upon the crop is apt to be so excessive, as to lead him to throw up the cultivation in despair. Whereas, if he perseveres, after a little experience, he will find it but little, if any, more expensive than that of Indian corn; and the profit five times as great.

After the ridges are finished, a man with a light rake smooths the top of each ridge, so as to make it three or four inches wide. On this the seed is sown, either by the hand or the drill machine. The former is the most certain; the last the most economical and expeditious. In the commencement of this cultivation, the farmer ought to use the latter. It is easy to be procured, and cheap

and every facility ought to be provided to diminish the labour of the cultivation, which almost every farmer, at the commencement of it, deems excessive. The great difficulty of drill machines, is, that they are often liable to get clogged, and sometimes miscarry. Besides, it is next to impossible to prevent their sowing the seed too thick—a circumstance, which is almost always the cause of a deficiency in this crop. For, although it would seem easy enough to cut all surplus plants out by the hoe, in either weeding, yet it is found by experience very difficult. One carrot ought not to be nearer than three inches of the other, in order to obtain a great crop, which always depends more upon the size of the plants, than on their number. To cut them out at this distance, when they are sown too thick, is an affair of some labour and care. When young, the carrot is so small, that the labourers never fail to spare too many; partly through indolence, and partly because when thinned to the degree they ought to be, at this period of their growth, the appearance of the crop is diminutive, and apparently unpromising. If a farmer can counteract this propensity to spare the plants, a drill machine will greatly serve his crop. However, some agriculturalists strongly incline to the opinion, that it will pay well, by the facility which is thereby given to the after culture, to put the seeds in by a dibble; that is, making holes at the proper depth and distance, with a pointed stick, and depositing the seed by hand in them; afterwards rolling the land. This, however, we shall not recommend; the other is so much more expeditious, and the crop sufficiently productive. After the seed is deposited, it would be well to pass a light roller over the ridges. This completes the sowing.

As it is the after culture, which makes the greatest objection to the field cultivation of carrots, we shall be the more particular upon this point. And, first, we observe that the mode, which we have recommended to pursue in

our rotation, by which all the requisite manure is put into the ground the previous year, greatly diminishes the labour and expense of the carrot cultivation. The seeds of weeds usually sown with the manure, having been, in a great measure, eradicated by the cultivation of the potatoe, in the second year of the rotation. If the carrot be sown as soon as possible after the ridges are made and raked, while the earth is yet fresh, it will have the advantage, and get out of the ground before most of the remaining weeds. As soon as it is out of the ground, the care of the plant is immediately to be commenced. Here it may be well to notice a common maxim, in order to improve upon it. It is generally said, "hoe as soon as you can see the weeds." But in relation to this carrot cultivation, the best maxim is, "hoe as soon as you can see the line of plants." Whether you can see weeds or not, be assured they are starting; and this is the moment, which, if lost, and the weeds permitted to get a little in advance, will occasion a very considerable additional labour to the cultivator and of injury to the crop. This first hoeing ought to be on the sides of the ridges, and with a general weeding of the top; so that the small weeds may have no advantage over the carrot. As soon as this is completed, a double mould board plough ought to be run through the furrow, deepening it, and throwing the earth to the plants. Or if the farmer have no double mould board plough, a single plough may perform the same operation, by throwing the earth to the side of each ridge successively. By this early attention, where the cultivation of the preceding year had been also carefully performed, the whole labour of this first weeding often does not exceed three days labour to the acre. Whereas, if the operation be neglected five or six days, it cannot, probably, be so well done by an expense of ten days labour.

In about a fortnight or three weeks, the second weeding should take place. The plants will then have acquired

some strength, and the weeds some size. A single mould board plough may pass up one side and down the other of the ridge, as near as possible, without injuring the crop; and throw the sides of the ridge into the furrow. The plants should then be thinned to the state in which it is designed, finally, to leave them. After this, and after the weeding is completed, a double mould board plough; or, where this cannot be had, a single one should throw the earth, which is in the furrows, again about the plants. This second weeding, if well done, completes all the necessary labour of weeding and ploughing. The crop will, probably, be benefited by a repetition of them both. And if leisure permit, or the circumstances of the crop indicate the necessity of it, they should both be done again. This, however, will hardly ever be necessary; particularly if all the antecedent cultivation has been well conducted. Both these weedings and hoeings ought not to cost more than ten days hand labour for each acre of carrots.

The time of sowing had best be about the middle of May, and ought not to be postponed later than early in June.

In harvesting the crop, a common plough run close to the plants, and throwing off the earth, leaves them standing in rows, so liberated from the soil, as that they are easily pulled up by handfull, and thrown into carts to be topped and housed.

As in the system proposed, a part of this third year's rotation should include both carrots and turnips, it remains to say something on the cultivation of this root. Of all turnips, the Swedish turnip (*Ruta Baga*) is unquestionably to be preferred for its productiveness, for its nutritious qualities, and for the facility with which it is preserved late in the succeeding year.

The sowing ought to take place, in our climate, between the tenth and thirtieth of June. With respect to its cultivation, but little need be added to what has been said in

relation to that of the carrot. It is, however, a great point to be attended to, that the seed should be put into the ground upon the fresh earth; that is, the seed should be sown as soon as possible after the ridges are made and raked. The rows ought to be also at a greater distance than those of the carrot; at least three feet a-part, and the plants twelve or fourteen inches asunder in the rows. The first hoeing may be postponed a little later than that of the carrot. However, in general, the earlier after the line of plants can be seen, the better.

With respect to the harvesting the Swedish turnip, no particular remark seems necessary. The mode is similar to that of the carrot, and also familiar to all our farmers.

The preservation of both vegetables, during the winter, is an affair of more nicety and importance. Carrots are easily kept in masses, in a cellar or place out of reach of the frost, provided they be dry when put into it. But if wet, they will be in great danger of heating and decaying. To prevent this, they ought to be taken out of the ground in dry weather. If possible, after they are topped, they should be permitted to be in heaps, under cover, for a week or ten days. This precaution is particularly requisite, where the quantity raised is great. With it fifteen hundred and two thousand bushels may be safely deposited in bulk. Without it, a much smaller will be likely to be injured.

As the want of cellar room is an objection often made to the attempt to cultivate this vegetable, upon a great scale in field culture, it may be useful to state the following mode of preserving them above ground, which has been practiced with success.

Let the roots be dug up in dry weather, and piled on an earthen bank, on which is spread a layer of straw. Let the carrots be laid in two piles upon this straw, with the tops turned outwards, and their ends folding over one another, while the smaller roots are left and thrown into the

centre. This stacking may be continued to the height of four feet, when the whole is to be covered with an additional quantity of straw. A trench is then to be dug all round the heap, and the dirt thrown upon the carrots, covering them about one foot in thickness. After this, a little more straw, and with horse manure or sea-weed should be thrown upon the earth, and the whole rounded off so as to shed rain. If this be done effectually, the carrots will be secured against frost, and afford a regular supply of winter food for cattle.

After the carrots are harvested, the land ought again to be thrown into ridges, to expose it to the action of frost, in the same manner in which it was in the autumn of the second year. This completes the cultivation in the third year of rotation.

SEC. IX. OF THE FOURTH, FIFTH, AND SIXTH YEARS OF THE ROTATION—THE BARLEY, CLOVER, AND THE HERDS'-GRASS YEARS.

We shall suggest little concerning the management of the crops during the fourth, fifth, and sixth years, because the common practice of Massachusetts farmers is, in general, sufficiently correct in respect to the grain and grass crops. At least, if it be not, we do not propose here to criticise it. The particulars in which our grain and grass cultivation is deficient, do not enter into the scope of these remarks; which have had principally in view, to give some light concerning the management in the three preparatory years, and to draw the attention of our farmers to systematic agriculture.

As far as our experience extends, the common practice of sowing clover and herds'-grass in the spring, immediately after the sowing of the grain, is superior to that recommended by some European writers, of sowing them in the autumn after the grain crop is harvested. Clover and grass sown in the autumn, are, in this climate, ex-

tremely apt to "be winter killed," as it is termed. For which reason, sowing in the spring is to be preferred.

The small quantity of seed sown for grass and grain, is also, it is thought, a great mistake in our agriculture. There should be never less than twelve pounds of clover, and half a bushel of herds'-grass; and after a thorough harrowing, the seed ought ever to be rolled by a heavy roller. The neglect of this is also a very common error among our farmers. The advantage of the roller, in further burying the seeds, and giving them more advantage from the earth by bringing its parts into close contact with them, is obvious, and needs no illustration.

SEC. X. OF THE RESULTS OF THE ROTATION PROPOSED.

As in the suggestions here made we have had chiefly in view the farmers of small capitals in our Commonwealth, it may be useful to consider the system in its result, after the first six years have elapsed and the rotation is completed.

Let us suppose a farmer owning sixty acres of land, of which thirty acres is arable land, and the residue pasturage. In his present system of management, he ploughs up ten or fifteen acres of land, annually; manures, as well as he can, but without system; always selecting every year such pieces for cultivation as he deems will give that year the most product. Thus the best parts of his farm are every year forced to their utmost productive power; and, if not gradually deteriorated, yet certainly not ameliorated by this cultivation; for his manure, being divided among such a number of acres, is insufficient for their necessities. When his land is laid down, it is kept in grass as long as possible; the consequence is, that the crops of the latter years are small; and the sward becomes matted and bound, so that the breaking up requires a considerable power of team, and a great expense. Grain and grass being sown after only one hoeing or clearing crop (for the most part

potatoes or Indian corn) the seeds of weeds contained in the manure are not extirpated, come up with the grain and interfere with the grass, and materially affect both crops. Such is the scene our farming too often exhibits.

Upon the system suggested on such a farm, only five acres are to be manured annually, but those thoroughly. No farmer, owning such an extent of land, with the quantity of stock this system will enable him to keep upon it, but can command with a little care and attention, one hundred and fifty loads of manure. He will thus be enabled to give to each of the five acres thirty loads. This, although not as much as might be desirable, yet will be sufficient. In the case supposed he has thirty acres of arable land; of consequence, at the end of the first six years of rotation, all his land will be in heart deeply ploughed, and in fine order; and his thirty acres will be in this state of product.

Five acres in Oats, at 2 tons per acre—10 tons.

Five do. in Potatoes, 200 bushels to the acre—1000 bushels.

Five do. in Carrots and Turnips, 400 bushels to the acre—2000 bushels.

Five acres of Barley, 30 bushels to the acre—150 bushels.

Five acres of Clover, 2 tons to the acre—10 tons.

Five do. of Clover and Herds'-Grass, 2 tons to the acre—10 tons.

With respect to the estimated product, we have placed it lower than the farmers of this country have a right to expect, on the average of quality of the lands in the Commonwealth, with such cultivation as is proposed. Thus potatoes managed, as we recommend, can scarcely fail of producing, in good years, two hundred and fifty and three hundred bushels; and in good land, the manure being also good, four to five hundred. So also with carrots; we know that four hundred bushels of carrots is only an ordinary crop in this mode of management, and that five and

six hundred bushels may reasonably be expected. The other estimates of the probable quantity of products, are also systematically placed lower than may fairly be anticipated.

If such farmer be located at a distance from the market, this quantity of hay, oats, and vegetables, will enable him to keep at the end of the six years' rotation, fifteen head of cattle, or an equivalent number of any other stock. Besides the profit upon the stock, the manure cannot be less than two hundred loads. Let any owner of sixty acres of land, compare this result with that which he at present realizes. Let him also take into view the state of his land, at the end of the first years of such a rotation, compared with its present state. We have no apprehensions, but such a comparison will every where be sufficiently encouraging.

With respect to the money price of these articles, it is difficult to fix any general estimate, for every part of the Commonwealth. But we apprehend that the oats, clover, and grass, will be estimated sufficiently low at ten dollars the ton; the barley at one dollar the bushel; the potatoes, carrots, and turnips, at twenty-five cents the bushel. The money product of these thirty acres will then be the following:

30 tons of Oats, Clover, and Herds'-Grass Hay,	-
at \$10 per ton	\$300
150 bushels of Barley, at \$1	150
1000 do. of Potatoes, at 25 cents	250
2000 do. of Carrots and Potatoes, at 25 cents	500
	\$1200

A cash product of \$40 the acre. This, we apprehend, is its lowest estimate. In far the greater part of Massachusetts, the value of this amount of articles would be greater.

It remains to add a few words relative to the necessary expenditures on a farm, managed upon this system.

The great discouragement of our agriculture, if you believe the complaints of farmers, is, the high price of labour. It may be questioned, however, whether the greatest discouragement be not the want of system, and inattention to the application of all the facilities, which connect themselves with the practice of their art.

A farm of this number of arable acres ought, and may be managed by two men all the year round, with occasional help during the harvesting season.

The labour of the farmer and his family we estimate at	- - - - -	\$250
That of one man at \$12	- - - - -	150
That of extra help	- - - - -	100
The support of the family we estimate at	-	200
		<hr/>
Making the aggregate of expenditure	- -	\$700
To this may be added taxes and incidental charges		50
		<hr/>
Total,	- - - - -	750
		<hr/>

Against incidental charges also may be placed, by way of off-set, various small incomes from fruit, wood, the garden, and the like—leaving a net balance of cash, or what is better to the farmer, of value in productive stock, of - - - - - \$450

Our remarks have been made upon the basis of a farm of sixty acres. The average value of which farms in the Commonwealth may be estimated, we apprehend, at \$75 the acre. This is equal to a capital of \$4500.

Upon which capital the net balance of profit is equal to an interest of ten per cent., after deducting a full compensation for labour and expenses. The profit, however, is necessarily much greater than this. Because, upon this

system, a regular and systematic amelioration of the farm is contemplated, which is so much an annual increase of capital. Considering the nature of the investment, its security, certainty, and the many incidental advantages connected with a farming life, it cannot but be admitted, that the result is sufficiently encouraging.

SEC. XI. THE BENEFIT OF ROTATION IN CROPS FARTHER CONSIDERED.

It is scarcely possible for a farmer to conduct his farm long, upon a principle of regularity in the rotation of his crops, without perceiving the most solid advantages resulting. First, this principle necessarily extends his view, in relation to his agriculture. His calculations must, in such case refer, and all his operations be conducted in relation, not to the product of a single year, but to that of all the years included in the rotation. Of consequence, he omits nothing, and sacrifices nothing for the sake merely of the present year's profit. In the usual way of management, a farmer is extremely apt to be led away from the pursuit of the great object of wise attention, the general amelioration of his farm, to a mere temporary object—this year's profit. His manures are divided about on his land; a little to the Indian corn, a little to the potatoes, a little to the top dressing of his grass lands. In three or four years, he has nothing to show for it. He hardly knows himself, at the end of that time, how it has been distributed. Now, nothing is so likely to be done effectually, as when it is done systematically. If the farmer's principle be to manure but once in six, or seven years, and he knows that all his arable land will have the same chance, in that period, he manures more liberally because his fund of manure is relieved from the contending claims of rival crops. His attention, also, is not distracted towards a variety of objects. His round of duties are every year the same. One year's experience is immediately beneficial to the rest. The little facilities,

and the little economies, on which so much of agricultural success depends, are more easily practiced or observed. Besides, incidental advantages result, which are not anticipated. Thus, for instance, the habit of laying down land to grass, without having any fixed period, at which to break them up, leads to a postponement of that operation as long as possible. After the second year, the herds'-grass crop begins to dwindle. This leads farmers to top dress, for the sake of getting a year's good crop. In this they are usually successful. But it is by the loss of one half the manure, which is thus spread upon the ground, and a great part of the riches of which are, when spread in this way, either evaporated by the sun, or washed away by the rain. Now rotation excludes top-dressing. All the manures are ploughed into the soil, and amalgamated with it. Nor is top-dressing here necessary. Because, before the grass dwindles from lapse of time, the plough comes over it, in its regular rotation, and the roots of it and their aftermath are made to contribute to the succeeding crop.

Another consequence of laying land down to grass, and having no regular period for breaking it up, is, that this operation is almost never performed, so long as the land will yield any thing to pay for mowing. The consequence is, that the land becomes "bound out," as it is called; that is, the sward has grown so hard that plants of tender fibre will not shoot through it, or flourish in it. The result of which is, that it is so tough in the sward, that no plough with a single yoke of oxen can turn it over. Hence it results that, perhaps, nine-tenths of our breaking up, in Massachusetts, is done with two yoke of oxen, and by two men; one at the cattle, and one at the plough handles; at the enormous expense of three or four dollars the acre. This expense renders the farmer unwilling to break up often, and causes him to neglect, much more than he ought, that great instrument of agricultural riches, the plough.

Now we venture to affirm, that there is no land in Massachusetts, which, after having been subjected to the course of rotations here suggested, may not be broken up, by a plough running with one yoke of oxen, and driven and directed by one man. By which, one half the labour of that, perhaps, most expensive of all agricultural operations, is at once saved. For this purpose, however, the plough must be of a well selected kind, and the oxen good. On these topics the Trustees mean to enlarge in some future number of their Repository.

There is another effect naturally, though not necessarily, growing out of a system of rotations; the abstaining from pasturing mowing lands. A system of rotation can only be applied to arable lands. This leads to a permanent division of the farm into arable land and pasturage. The interior fences, between the lands destined to the plough, will soon be found useless for all purposes, except that of pasturing his cattle upon the aftermath, or autumn feed of the mowing lands. When the saving of the expense of these interior fences is taken into connexion with the short time grass is permitted to occupy in each rotation, and the great injury done by the hoof and the tooth of cattle, the good sense of our farmers will gradually come into the practice of keeping their mowing lands exclusively appropriated to the scythe, during the years in which grass is permitted in the rotation.

The subject admits of much greater illustration. But we have already exceeded the limits we proposed to ourselves in the commencement of these remarks; the object of which has been, to draw the attention of intelligent and practical farmers to the subject, in the hope that it may lead to a better practice, than at present prevails in some parts of our state; and also to a fuller elucidation of the topics by some more competent hand. C.

ON A WORM, WHICH ATTACKS THE APPLE TREE. BY
JOHN PRINCE, ESQ.

[To the Corresponding Secretary.]

Jamaica Plains, July 1819.

DEAR SIR,

I HAVE, within a few years past, lost a number of apple trees, of ten to fifteen years old, and was not able to account for it. My young trees, also, that were beginning to bear, produced chiefly wormy and knurly fruit. The last year I found what I supposed to be the cause, which was, a small white ringed worm, about 3-4ths of an inch long, with a dark coloured head, (I believe the same that attacks the peach tree,) attacking them at and just below the surface of the ground.

I mentioned the subject to Professor Peck, yourself, and several other gentlemen, who had never heard of this destroyer of the apple tree. I feared much the loss of all my trees, of which I have near one thousand, and mostly of my own planting.

This spring, a man who was grafting for me some old trees, told me he had trees that had been affected in the same way, and that they were very easily got rid of, by digging round the tree and clearing away the earth to the roots, and then with a sharp pointed knife, a chisel, or gouge, (and a small wire to probe, if they were deep in the tree) they were easily destroyed. I employed him in June for this purpose. I believe there was not an apple tree on my farm, but had some worms; and from some of them *twenty-four* were taken, and the trees almost entirely girdled, and would not, probably, have lived through the year.

After taking out all that could be found, the wounds were covered over with grafting clay, and a large propor-

tion of dry wood ashes mixed, and the earth then returned to the tree.

I shall have them again examined this fall, and looked at every spring; the trouble is much less than would be imagined, till tryed. One capable man will dig round, and turn the sods, two or three feet from the tree, (and which is also extremely beneficial to young trees in grass ground,) and examine at least thirty trees, in one day; and in garden, or ploughed ground, one hundred.

When it is found how little expence is required to extract these destructive little worms, I do hope, those persons who have young trees particularly, would examine them as soon as possible.

They are soon discovered by the worm casts, or *saw dust* borings, which should be followed, and wholly extracted.

I have also lost several mountain oak and quince trees, by, I believe, the same destroyer.

Very respectfully yours,

JOHN PRINCE.

ON FREEBORN'S PATENT PLOUGH.

[To the Corresponding Secretary.]

Boston, September 1, 1819.

I RECEIVED early in the spring of this year, from Isaac Bronson, Esq. of New York, a plough denominated by him, "Freeborn's Patent Plough." Having found upon trial, that it fulfilled all the expectations Mr. Bronson had previously raised concerning it, I requested him to write an account of its character and success. His letter is inclosed, which you are at liberty to publish, should it be deemed useful.

Concerning its superiority, I have had the opinion of every practical farmer, who has witnessed its operation, I believe, without an exception. The effect upon my farm is this; that I now break up, with ease, the same quantity and qualities of land, say one acre, in a day, with one yoke of oxen and one man, who both holds and drives, which was never before, to my knowledge, broken up with less than two yoke of oxen and two men. My ploughmen agree, that it takes one third less power to do the same work than common ploughs require. One of them to express his approbation of it, said, "That poor as he was, if another such plough could not be bought, he would give one hundred dollars, rather than not have it, had he a farm of his own."

It is the best plough, beyond all question, I have ever had upon my farm.

Respectfully,

I am your obedient servant,

JOSIAH QUINCY.

New York, May 3th, 1819.

[To Josiah Quincy, Esq.]

DEAR SIR,

I AM happy to learn by your esteemed favour of the 10th ultimo., that Freeborn's plough, which I had the honour to send to you, has been found upon trial to answer my recommendation. The best evidence of the superior properties of this patent is, the universal preference given to it by the farmers. Mr. Freeborn informs me, that he has sold more than six hundred within the last forty days, to farmers residing within thirty miles of this city; and that he sent more than one thousand, last year, to the state of Virginia. The demand increases so rapidly, that his factory is not able to supply it, although he makes from

two to three thousand a year: and yet it is but a little more than two years since they were first introduced. There are three sizes, suitable for one, two, or four horses. In any kind of land, which is in a condition to be ploughed, some of these may be used to advantage. In new lands, where there are many roots or stones, the largest size, with a wrought iron share and locked colter, does best. For this purpose, the nose of the share must be pointed to suit the eye or mortice in the colter; but in other respects it should be made like those which are cast. Any smith can make them. This share and colter may be taken off, and a cast share and cutter used in their place, or the share without the cutter. In stony ground, where there are no roots, a share of wrought iron laid with steel, shaped exactly like those which are cast, is preferred, without either cutter or colter. One set of screw bolts fasten all these different shares. There are three notches in the clevis, either of which receives the hook of the chain, and by which the depth of the furrow may be regulated: and for the same purpose the beam can be raised or depressed, by turning the nuts on the upper and under side of the beam, on the screw which passes through it. The pin of the clevis serves as a wrench for turning the nuts; and by having three holes for it, at the end of the beam, the plough may be set more or less to land at pleasure. After the irons become polished by use, it will be found that the plough passes through the ground with very little friction, and with much less draft than other ploughs of the same size, owing probably to the spiral wind in the plane of the mould board, combining, in some degree, the powers of the wedge and screw, in raising and turning the furrow. A supply of new shares, which is the only part liable to be worse for wear, may always be had at sixty cents each, by sending to the factory the number of the plough. The following are the prices:

For No. 1, or the one horse plough without the cutter,
\$12 50—cutter \$1.

For No. 2, or two horse plough, \$15—with cutter \$16, and locked colter \$17.

For No. 3, or four horse plough, \$16—with cutter, \$17—locked colter, \$18.

Number three is the most useful plough, when complete, where only one is kept. There is another size which they now make, distinguished by No. 1 1-2, suitable for one or two horses, which costs, with a cutter and two extra shares, sixteen dollars.

With great respect, I am, Sir,

Your most obedient servant,

J. BRONSON.



ON THE INSECT FOUND IN APPLES AND PEARS.

[To the Corresponding Secretary.]

Charlestown, July 12th, 1819.

SIR,

IN the third volume of Dr. Willich's Domestic Encyclopædia, first American edition, by Dr. Mease, page 116, under the article fruit trees, there is an account of an insect, called the Curculio, by Dr. James Tilton.

It is there stated, that this insect, belonging to the beetle order, delights most in the smooth skinned stone fruits; but when they abound, will attack the apple and the pear; that pears are less injured by the insect, than apples; and that the insect escapes from the fruit to the earth, where, like other beetles, it remains in the form of a *grub* or *worm* during the winter, ready to be metamorphosed into a *bug* or *beetle*, as the spring advances. He supposes, that the curculio preys upon the roots of fruit trees, during its retreat, below the surface of the earth.

In the above, Dr. Tilton professes to describe the insect which preys upon the fruit in Pennsylvania and Delaware, but does not affirm, that it is found in the other States, though he thinks it probable that it is.

From Dr. Tilton's communication, above referred to, the reader might be led to believe, that the curculio, therein described, is the same genus of insects with that which is found in pears, but more often in apples, in the vicinity of Boston. This, however, is not the case, as will appear by the following statement :

The insect found in apples and pears, in this part of the country, causes much of the fruit to ripen, or rather to die, before it is fully grown ; more probably, to fall to the earth while green, and by preying upon the pulp, near the core, sometimes perforating to the surface, together with the unsightly appearance of the worm itself, causes the apple or pear to be very often rejected as unfit to be eaten.

Perceiving one of the insects last mentioned, in the core of a St. Michael pear, I placed this core, containing the larva, in a wooden box, about two inches in diameter ; and having removed a part of the bottom of the box, instead of the part removed, I put a piece of glass that I might be enabled to see the insect.

On the thirteenth of October, 1818, I observed in the top of the box a small fibrous covering, intermixed with very small pieces of wood. This covering contained the insect, which had changed into the pupa or chrysalis state. The core was placed in the box about the first of October. I left small apertures to admit the air.

By its placing its web in the top of the box, I conclude that the insect, on leaving the fruit, does not enter the earth, but ascends and forms its web, in some dry situation.

In this state the pupa remained in my office, where water freezes in the night when the weather is cold. On the morning of the twenty-third of June, 1819, when the insect had been in the chrysalis state during a period of eight

months and ten days, I saw that the fibrous covering had been burst at one end, and a greenish shell, of the size and shape of the larva, evidently its skin, lay partly excluded from the fibrous covering. One end of this shell was also broken. On looking further I perceived, laying in the box on its back, without motion, a small moth or miller.

On opening the box and touching the miller, it flew very briskly toward the window, where it was caught and again shut up in the box.

The body of the miller is rather smaller than the above-mentioned insect, from which it originated. It has four wings, which, when it is not in motion, are partly closed, so that it has the shape of a fan half shut. The upper wings, which conceal the lower ones, have undulating stripes across them, of a dark colour, on a ground of light slate colour. The eyes, when the miller is alive, are of a deep black. The antennæ, the bottom of its body, and the legs, which are six in number, are of the colour, in the living moth, of a new slate pencil.

I had afterwards placed the core of an apple, containing one of these insects, in the same box. This worm formed an outside covering similar to the other. This I examined on the sixth of July, and found that the insect had died before the inside of the fibrous covering was completed.

The exact similarity of the situation, shape, appearance, and materials of the coverings made by these two insects, proves, I think, that they both belong to the same species.

On taking away the covering from which the phalœna had arisen, I found that the larva had bedded itself in the pine wood, of which the top of the box is composed, by eating away the wood till it had formed an excavation of the length, breadth, and in the middle, of about half the depth of its own body. The bottom of this excavation, as well as the inside of the fibrous covering, was lined with an exceeding fine silky substance. The small morsels of wood which had been taken away, were every where mingled with the fibrous covering above, and contributed to its

strength and hardness. The operations of making the covering and the excavation, must, therefore, have been carried on at the same time.

Whether the male and female are of the same form, in what manner they deposit their eggs in the young fruit, and at what time, &c. are questions which I have not an opportunity of solving.

King-birds and swallows, more particularly the latter, probably destroy numbers of these millers.

This circumstance is, perhaps, a new reason, why farmers should protect the swallow, and endeavour to increase the number of those birds.

I am uncertain, whether the nature of this insect has been before investigated, but I do not know that it has; if it has not, the above, though very imperfect, may lead some one, who has better opportunities, to examine the nature more completely, not only of this, but of those which prey upon cherries.

I send herewith the top of the box above mentioned, in which you will see the excavations; also the fibrous coverings of both insects, the shell, and a part of the miller. I regret that my ignorance of the extreme fragility of the insect's form caused it to be broken.

Yours respectfully,

JOSEPH TUFTS.

CONSIDERATIONS CONNECTED WITH A SURVEY OF THE
AGRICULTURE AND MANUFACTURES OF MASSACHU-
SETTS.

[Communicated for the Massachusetts Agricultural Repository.]

It is desirable to see spread before the public, a full account of the annual products of the soil, and a statement of the amount of manufactures in Massachusetts. We can

conceive of no measure so likely to give a spring to our husbandry. We know that our agriculture feeds and clothes hundreds of thousands, besides furnishing a respectable export. But all this is done with so little observation and reflection, that we appear not to be aware how much we are indebted to the rugged soil of our state, poor as our husbandry is; and are willing to hear, with too much of acquiescence, the scoffs against the occupation of the husbandman, proceeding from those who know little more of it, than that their tables are daily spread with the fruits of it. An inquiry, such as we would propose, would give results shewing the agricultural and manufacturing character of every county, and the distinguishing features of each. We should then know their resources respectively, and be able to speak with better grounds of discrimination, of our dairy, grazing, grain, and manufacturing counties. In a country so new as ours, it may be thought that such distinctive appellations would be premature. But so far as they could be justified by the present pursuits of the population of different counties, it might be of use to apply them. The discovery and publication to the world, that one country was distinguished for its fine cattle and numerous herds, its dairies, and the excellent quality of its butter and cheese; a second for its grain crops; a third for its woollen fabrics; and a fourth for fabrics of cotton—that such a proportion of the inhabitants of one town were engaged in the manufacture of straw bonnets, amounting to a large sum in the year; and that another was no less distinguished for some other branch of useful manufacture—the notoriety of all this would re-act as a stimulus to industry; and what is still more important, the distinct, clear, and satisfactory knowledge the public, and our agricultural societies would have, of what is going on amongst us; whence we derive the various articles for the supply of our wants; from what districts specific commodities come, and to what amount; would enable us to

apply any aids for the encouragement of industry, more understandingly and effectually; and knowing in what particular districts improvements in any one art or branch of husbandry were most needed, government, or the agricultural societies, would apply their efforts to effect the object with more success, by appropriate encouragements.

Our agricultural societies are now numerous; sufficiently so, probably, to be able to furnish complete accounts of the different crops, and amount of manufactures the present year, throughout the Commonwealth. The details might be collected by committees from their own body, assisted by the assessors of taxes. Such an investigation might, perhaps, form the basis of a series of systematic efforts on the part of these societies. An accurate knowledge of their respective districts, such as would result from a minute inquiry and proper statement of their annual products, connected as it would be with an acquaintance with the soil and methods of husbandry, would naturally lead to a serious consideration, how far the aggregate of the harvest corresponded with the capabilities of the soil, assisted by a judicious husbandry. It would be perceivable, at one view, how large a sum the difference would be between the gain of a negligent, and that of a skilful culture, on the mass of crops in the whole county; a sum which, in some cases, would be found to be greater than the public expenses of the county for the year. This further benefit would arise, in obtaining from individuals an account of the produce of their farms, considerable variation would be remarked in the quantities, where, perhaps, none ought to be expected, considering the qualities of the natural soil, and the equal extent of the farms. Whence arises this difference, would naturally be asked? Is it in the quality of the implements? Is it in the character of the stock? Is it, that in the one case artificial means are made use of to make manure, and not in the other? Is it in the greater economy of the household? Is it that the wet meadow is on one farm

farm ditched and warmed with a coat of gravel, and not on the other? Is it that the fruit trees are pruned and kept clean, and the soil kept open around them while young, in the one case, and not in the other? Is it that the barn is open between the boards, and lets in the weather, so as to injure the hay in one instance, and not in the other? Is it that the farmer in one case ploughs his lands in the fall, and the other does not? We think questions of this sort would naturally arise in seeking the results of farming operations for the year; and the answers to them, as often as they could be obtained, would furnish a mass of valuable facts, on which to ground a course of very efficacious measures of reform; one of which might be, to confer rewards on those whose farms should be found remarkably well husbanded. The distinction which a reward for good husbandry would give, as it would have for its basis the character of the man, would operate more powerfully on others as an incentive, than a premium obtained at a cattle show, for a fat ox or fine sheep, as the animals might be an accidental acquisition by purchase, and their quality in no degree connected with the general skill or habitual application to the best methods of husbandry on the part of the owner.

We may add further, that as the life of the husbandman is more retired and independent than that of most other classes, and he naturally feels less concern about other people's opinions, in relation to his mode of managing his own concerns, he is less likely to derive benefit from the light of other men's minds, or their better management of their property. The proportion of men is small, that, from the impulse of their own mind, labour more than their necessities require. It is therefore important, that farmers should be awakened to feel that they are united by ties of interest, as husbandmen; and that by lending the aid of their counsel and experience to teach each other, they may one and all be benefited. To this end, it may be useful to shew the sum of the produce of one farm added to that

of another, and that of all the farms of a county, gathered into one gross amount, and held up to the world as an object of common pride and interest, and set in array with that of the other counties; displaying a mass of agricultural wealth, which, as it may teach our farmers to respect themselves more, will attach them more to each other, and incline them more heartily to engage in measures for common improvement, and the advancement of their common interest. Whenever men unite in a common object of interest and honour, whatever intelligence and activity belong naturally to the few, are always in a greater or less degree transfused into the whole. If our farmers once acquire a strong interest in the agricultural reputation of their county, they will stimulate each other to the improvement of their farms, and, by making a common cause, add the incentive of public opinion to that of their own necessities. Suppose the Agricultural Society of Worcester should commence a formal inquiry, what number of acres are usually under cultivation in that county? The next question would be, what does this number of acres yield of the different kinds of crops? And what quantity of each to the acre, ordinarily? What farms there are that do much better than the average, and why? What different processes are pursued to accomplish so much more? If the estimated value of the crops of the whole county is so much now, it might be in the power of the society to convince the farmers, that they may double this amount by imitating some individuals among them in a few particulars, in which it might be done without much, if any, additional expense. Such as, throwing aside their old and badly constructed ploughs, and using those of late invention, which have been proved to be a great improvement on the old. A single fact will place the importance of this recommendation in a striking light. On a trial, in England, to ascertain the quantum of power required to draw different ploughs, it was found that some, although lighter than others, em-

ployed one third more power to move them in the furrow. The instrument used to ascertain the draft, was of simple construction, and might be relied upon to give an accurate result. The difference arises principally from the form of the *mould board* of the plough. The writer of this communication has seen in operation, on the farm of the Hon. Mr. Quincy, one of Freeborn's Ploughs, marked No. 3, made in New York. One man, with a single yoke of oxen attached to this plough, was breaking up land, which had always required, with a common plough, two yoke, a driver and a man to hold the plough. The lines of the furrows were straight, and the sods turned completely over; and what was particularly worthy of remark, the cattle laboured without any apparent exertion.

Fall ploughing for spring crops, if it were universally in any one county, and followed up by so many ploughings in the spring, as, with the aid of the harrow would reduce the soil to a mellow state, would make a prodigious difference in the aggregate of the gains of the county. By presenting a view of the benefit to a large district of country, by the introduction and general adoption of any one improvement, our agricultural societies may do much good. The average crops in England, with the same labour, no more manure, and land of the same quality, are much greater than in this country. Their implements are better, and their husbandry more skilful. It is in our power to procure, therefore, as good returns from our lands as they from theirs. We would refer the incredulous to the printed accounts given in, under oath, of the crops of potatoes and carrots, for which premiums were granted by the Trustees of the Massachusetts Agricultural Society, at the Cattle Show last year. These accounts may be found in the Repository, published last January. From them it appears, that the net gain, upon an acre of carrots, amounted to between two and three hundred dollars. Now it is of no more consequence to a poor man than to a rich one,

how many days labour a field of carrots may require, provided he is not only sure of being indemnified by the crop, but may be almost equally sure of making ten times the profit by a careful, than he would do by a slovenly and imperfect culture. When our farmers see accounts of crops of six, and even eight hundred bushels of carrots to the acre, and almost as many potatoes, they are apt to suppose, that all the difference between a common crop of one hundred and fifty, or two hundred bushels of potatoes, and two or three hundred of carrots, and the above, is the effect, if not of magic, at least of so much additional labour and manure, as would exceed, in value, this difference. Hence it is so rarely the case, that farmers in general avail themselves of the experience of the few who have been greatly successful, from superior method, diligence, and skill. And although the whole mystery may be resolved into thorough tillage, clean husbandry, and a liberal use of manure, the common cultivator will have it, in the face of well authenticated facts, that there is some secret fallacy, and that he, of course, who has the best managed and most productive farm gets the least profit, and that a man is poor in proportion to the magnitude of his crops! The only means of counteracting this bigotry to the ways in which they have been educated, is to bring frequently into view of the farmers, examples as near home as they can be found, of substantial profit as the fruit of every improvement. Our county agricultural societies may do this, not only by means of the exhibitions and statements, offered at their annual shows, but by disseminating information, through the medium of the newspapers, of improvements which are introduced from time to time on particular farms, whether in the stock, implements, or management of manures, as any such may fall under their observation. The clergyman, who is in the practice of visiting every house in his parish, and places himself on an intimate footing with his people, obtains a knowledge of their characters, habits.

and circumstances, which, if he is a practical and sagacious man, he may employ to maintain over them an uninterrupted and salutary authority. And we know not why a town or county agricultural society, may not propose to itself to become acquainted with the business of every farm within its own sphere of operations, and establish, by its influence, a sort of voluntary accountability on the part of the farmers to itself. Or, as it is probable, that most, if not all, the substantial farmers, if invited, would join such a society, why may we not hope, that they will pledge themselves to each other, to adopt whatever improvements the sense of the Society may recommend?

As the character of the staples of Massachusetts is humble, compared with that of the southern states, we sometimes hear agriculture spoken of, as a pursuit, in terms of derision. But we know of no part of the world, in which the great body of the people have it in their power to live more independently and happily, than in this Commonwealth. And if the hazards of foreign trade are taken into view, there is no class of men, who hold their earnings in so great security as the farmers, or who have it so certainly in their power to better their condition, by regular and progressive steps. This may be accomplished by no more labour than is healthful; no more frugality than may be called by the names of temperance and moderation; and no more thought, calculation, and reflection, than becomes the dignity of man in any calling. Whatever discredit our agriculture may be in, among intelligent men, is owing wholly to our bad husbandry. And it is no doubt true, that there are many farmers among us, who are poor men, with a farm of from one to two hundred acres of land. It is common to hear husbandmen complaining of the burden of public taxes, and that these eat up their profits.

This suggests another reason, for which it is desirable that an account should be taken of the produce of agricultural industry in this State. We think it would turn out,

that in those districts of country, which are well cultivated, the public burdens bear a very small proportion to the proceeds of the labour of the people. And were the soil of Massachusetts husbanded with the skill and care, which would entitle our cultivators to be called good farmers, we should hear no complaint of taxes in this most favoured country. To shew this in a striking manner, it will be gratifying to have it in our power to compare the total of our crops the present year, with that of the year 1825, as we doubt not that no inconsiderable improvements will have taken place in the mean time ; judging from the spirit which now appears to prevail.

It occurs to us also, that if, in those counties, in which any one branch of husbandry is more particularly attended to, the inhabitants could see, stated in figures, its annual value, it would give to it more importance in their eyes, as they would have a more distinct apprehension of its extent, and have a clearer perception at once of the whole benefit to arise from any proposed improvement. Berkshire, for example, is distinguished as a grazing county. If it were known what number of cattle are annually driven to market from thence, perhaps, as few among the inhabitants have made any calculation, the number might be greater than any are aware of, and the interest of the county much more concerned in cultivating only the best breeds, than has been supposed. If, then, it were found to be true, that the race of cattle, though large, yielded less flesh, in proportion to bone, than some other breeds of a middle size, and that the difference in profit on the latter, would be equal to from fifty to an hundred pounds a head, there can be no doubt, that the advantage of a change of breed would strike even the most indifferent as an important object.

Every one knows, that the crops of Indian corn were generally cut off by the frosts, in 1816. Had it been known what quantity of Indian corn is usually raised in a season in the county of Middlesex, for example, the loss in

1816 would, probably, have been so much more felt, that more attention would have been paid to the recommendation of a species of corn cultivated by Mr. Pomroy, of Brighton, and others; not a field of which suffered by frost in that year. This species, besides, bearing a large and fruitful ear, husks itself when ripe.

The effects of negligent husbandry, exhibited in its consequences, when it pervades a whole county, might, we think, afford an impressive lesson. All who have had occasion to pass through the county of Norfolk, in different directions the present season, must have been struck with the extensive ravages of the caterpillar, in the apple orchards. The first growth of leaves, of probably two-thirds of the apple trees, were consumed by the caterpillar. Nature was, of course, compelled to make a new and exhausting effort to supply foliage from the buds designed for the next year—"thus anticipating the growth of one year, and cutting off the prospect of fruit."* We will not undertake to estimate the loss to the county, but whether small or great, effectual means of destroying these vermin were within reach of every farmer; nothing more being necessary than to dip a sponge or rag, attached to a stick of proper length, in oil or strong soap suds, and apply it to the web. One thousandth part of the value of the fruit which will be lost the next season, in consequence of the neglect of this operation, would have paid the labour of performing it. Suppose there had been a county agricultural society for Norfolk, and that it had been the practice of procuring a valuation of the crops every year, of fruit, as of other kinds. With the knowledge it would have possessed of the loss to be sustained by the county the next season, by the caterpillar being suffered to remain unmolested, would not some effectual measure have been adopted to rouse the attention of the farmers to a sense of their interest, before it was too late?

* Professor Peck's Natural History of the Slug Worm.

We have thus ventured to speak with some confidence of the responsibility, which rests on the county agricultural societies. As all the members are farmers, they may not only point, but lead the way in improvements. And by exhibiting to the public the state of agriculture, in their respective counties every year, in statements of their crops and produce of manufacturing industry, the people of the Commonwealth will be furnished with the best evidence of the character of each county, and the inhabitants of each county with the most powerful stimulus to persevering exertion.

ALMS HOUSE FARMS.

[To the Corresponding Secretary.]

SIR,

I HOPED to be able to obtain for the present Number of the Repository, a sketch of the history and economy of the Alms House Farm in Salem. Those who have seen the account of its last year's produce, published in January, may have some curiosity to know more of the establishment.

As a well managed and uncommonly productive farm, it might afford a useful lesson to most cultivators. But, considered in another light, as an experiment to determine the practicability of drawing a support for the poor from their own combined labour, in the diversified operations of a farm, it is of incalculable importance to the whole community. Whether the farm has, in past seasons, yielded enough to provide common necessaries, and an overplus sufficient to defray the general expenses, we are, at present, unable to say. But even if it pays no part of the general expenses, and only a part of the maintenance, this is much more, we believe, than the labour performed in any other Alms House establishment, has ever before accomplished. Future accounts from this institution may

go far to settle for us, at least, the question, which has so much perplexed the world, viz. *Whether the poor can be made to support themselves?*

But that which favours the plan, in point of policy, as well as humanity, is its admirable fitness to accomplish all the ends of such an institution, by not only providing every comfort on the most eligible footing, for the sick and infirm, but constant employment adapted to every age, degree of strength, and grade of intelligence. It is excellent in every view of it, and recommends itself strongly to the adoption of all our large towns.

The Alms House, on the old plan, gives shelter to such, among other persons, as do not, or cannot, whether through natural incapacity, idleness, or vice, provide themselves a subsistence. But, in fact, the design of the institution, as an infirmary, seems so far to have pre-occupied the public mind, as to have prevented the thought of engrafting upon it any scheme for the regular, full, and profitable employment of all who are able to labour, with a view of defraying from the avails of it, any considerable part of the expenses of the establishment.

It is true, that in most Alms Houses there is a work-room; but the intent is more to keep loungers out of the way of the household business, and from absolute idleness, than to derive a profit from their industry. Their employments are, therefore, of the most simple and least productive kinds, requiring neither much exertion of strength, skill, or ingenuity. Besides, the inconveniences of a sedentary life, and the effects of confinement with a crowd in a close work room, both as respects health and morals, more than counterbalance the advantage. We as commonly hear of the Alms House fever as of the Gaol fever; a slow intermittent, the offspring of a life of inaction, confined air, and uncleanness. To say nothing of the tendency of the circumstances to which we have alluded, to encourage in a hundred forms, those grovelling vices which make many

of the poor of Alms Houses, as depraved as they are miserable.

In turning our eyes from a scene like this to the establishment at Salem, we are refreshed by the contemplation of one so different. Among the poor of all ages, and both sexes, there are few to whom the endless variety of the operations of the farm, does not furnish some healthful and profitable employment. We know that a faithful and economical husbandry, embraces, as important to many useful purposes, many kinds of very light as well as heavy labour. So that children of a tender age, as well as the infirm and superannuated, may, by slight offices, sometimes contribute materially to the success of the season, as well as the general melioration of the farm. An enlightened and sagacious superintendant assigns to each person, male and female, an occupation suited to their capacity and strength. And being himself thoroughly conversant with every branch of active and economical husbandry, he can be at no loss for something for every one to do. Knowing, as every good farmer does, how much success in point of profit, depends on a careful execution of a systematic plan of saving, and turning every thing to account, he is aware that there need never be an idle hand, however numerous his household. The bounty of nature is inexhaustible. She never fails to make ample returns for the most scrupulous nicety of cultivation.

How noble, how praise-worthy, is such an establishment! Pauperism here throws off all the badges of its degradation, with the habits which makes it odious. A.

REMARKS ON SOIL.

[From the Writings of Agricola.]

WHEN we cast our eye on the surface of this globe, and observe such a multitude of materials, differing in their

colour, bulk, form, weight, and other sensible qualities, all of them scattered in disorder, and blended in endless combinations, we are ready to conclude, that their number must be infinite, and their disposition under the guidance of no general laws. No judgment could be more precipitate, or worse founded. In this apparent scene of confusion the utmost regularity prevails: and the whole mass is made up of a few simple ingredients. The order of the parts is so determinate, that it obtains not only at the surface, but in the very bowels of the earth. The internal structure is composed of strata, either loose or solid, as far down as human art has been able to penetrate, and the presumption is, that they extend to a vast depth. With regard to Agriculture, our geological inquiries are bounded to the soil, on which we tread, and to the substratum which supports it. These, in a judicious system of Farming, are objects of great interest and importance; and both of them should be examined with a scrupulous nicety. The obstacles, which baffle the hopes of improvement, are just as likely to lie in the subsoil, which is placed beyond the reach of the ploughshare, as in the upper surface, which is more immediately subjected to culture; and for this reason, neither of them ought to be overlooked or disregarded. A coat of stiff clay has been rendered productive, by the mere circumstance of resting on a bed of sand, or a rock of limestone; and, therefore, every cultivator, who wishes to pursue a course of good management, should go over all his fields, by digging pits in various places of at least eighteen inches down, that he may know and discover the materials on which he is to operate. He can then lay his plan with greater certainty of success, and, what often happens, the subsoil may furnish him with the means by which to ameliorate the surface.

In the progress of this letter, I shall direct the attention of my readers to the component principles, which constitute that exterior covering of earth, with which our globe

is encompassed; I shall enumerate and explain their qualities so far as respects vegetation; and I shall point out some of the advantages which must result to Agriculture from beginning to analyze our soils.

Notwithstanding the different appearances which the surface exhibits, it is, in reality, compounded, in all its varieties of wet and dry, of warm and cold, of light and heavy, of barren and fruitful, only of four simple and primitive earths—clay, sand, lime, and magnesia.

I. Clay, called indifferently in agricultural publications, alumine, or argillaceous earth, is a substance so easily distinguished from all others, and so familiarly known, that it needs no particular description. When pure, it is white; but in general it is found discoloured by the mineral waters, which are perpetually escaping from their beds, and running on the surface. It is tinged with blue, brown, gray, and red shades, for it has a strong affinity to all colouring matter, but these tints affect it not materially in an agricultural point of view, and are, therefore, of little consequence. As an ingredient of soil, it has the four following properties, by which it exerts a powerful effect on vegetation:—

- 1st. It absorbs water like a sponge, and is so close in the texture, as to prevent it from filtrating through its pores.
- 2d. When thoroughly soaked, and afterwards dried, it hardens and cakes into a solid mass.
- 3d. It shrinks considerably in bulk, when exposed to heat, and the contraction of its parts is in proportion to the intensity of that heat.
- 4th. It powerfully retards putrefaction, by enclosing, as in a case, animal and vegetable remains, and thus shutting out the dissolvent action of the external air.

If we now call to our recollection the purposes served by the soil, and detailed in my last letter, we shall be enabled to judge how far clay, in its original and unsubdued state, is favourable to vegetation. The roots, which are the collectors of the nutriment, and are withal of a ten-

der and delicate texture, cannot easily stretch themselves in a substance of such stiffness and tenacity; and which, besides, so readily consolidates after rain into a compact body. Its closeness opposes material resistance to their extension, and accordingly, in its unmellowed state, the fibres are hampered, and cannot ramble forth to pasture. Besides, admitting that they overcome in part this obstacle in the soil, they must, whenever it hardens in the sun and gapes into chinks, be violently torn asunder, and separated from the stem. The stronger fibres may escape unhurt; but, generally speaking, the finer and more slender filaments must suffer considerably. If clay be so hurtful on the surface, it is almost equally pernicious in the subsoil, from the capacity it has of interrupting the passage of water downwards, and keeping the roots perpetually drenched—an evil no less destructive to the health and vigour of the crop, than the opposite extreme. From its antiseptic power, putrefaction goes on slowly, and the vegetables growing on it are ill supplied with that generous and nutritious food, essential to their perfection and maturity. All its qualities, therefore, are unfriendly to vegetation, except its capacity of absorbing and retaining moisture, and this is of such immense importance as, in some measure, to make atonement for its other defects. When existing by itself, this virtue which it possesses, in so eminent a degree, is useless and unavailing: but when mixed with other materials of a loose and friable nature, it gives tenacity and firmness to the whole, and is highly retentive of the dews and rains which fall to fertilize the soil.

II. Sand or gravel, called sometimes silex, silica, silicious matter, or earth of flints, is distinguished by properties of a totally opposite character, which require to be enumerated that their influence may be distinctly and visibly displayed,

1st. Sand is incapable of retaining water when poured on it, and far less of attracting moisture from the atmosphere.

2d. It powerfully promotes putrefaction, but allows the gases set at liberty to escape.

3d. It has little or no cohesion among its parts, and never binds by the alternations of wet and dry into a compact body.

It will appear from this account of the properties of sand, that it is provided as a corrector of alumine, and that in their effects, the two are destined to counterwork each other. This sort of contrivance in nature is no uncommon occurrence; and while we trace such remote tendencies and bearings, we are struck with the wisdom that fabricated and reared this noble edifice. Inconveniences are obviated by correspondent checks, and this system of balancing all things displays more conspicuously the indications of design, than if there had been no difficulties to overcome, and no evils to remedy. Let us contrast sand and clay in their qualities, that this singular and important truth may be more strongly impressed. Sand suffers water to filter easily; clay is highly retentive; sand promotes putrefaction; clay delays it, but absorbs the gases, which are formed in the decomposition; sand opens an unobstructed path for the extension of the roots; clay gives them firmness in their course, and supplies the moisture which sustains them; in fine, the two may be classed among the contending elements of matter, which, by a union, heighten their common virtues, while their defects are rectified and subdued.

III. Lime, commonly called calcareous earth, enters into the composition of soils.—This is never found naturally in a pure state, but in combination with carbonic acid, for which it has so strong an affinity that it attracts it from the atmosphere. The burning of limestone is undertaken for no other purpose than to expel by heat the carbonic acid, and reduce it to a caustic powder, for the purpose either of building or agriculture, and in this process it loses about the half of its weight. But no sooner is quick-

lime applied to use, and exposed to the atmosphere, than it greedily absorbs, first moisture, and then carbonic acid, and thus either in the ground, or in the new formed wall, it quickly hardens and returns to its original state.

1st. Lime is closer than sand, but much less adhesive than clay. It occupies, therefore, a middle region between the two, free from their imperfections, and blending their common qualities.

2d. It is a powerful promoter of putrefaction, and helps to decompose the animal and vegetable matter, lying in the soil. To this circumstance is owing, in a great measure, its efficacy as a manure.

3d. It has the power of fixing and retaining a very great quantity of carbonic acid, and although it combines chemically with a certain portion, which can only be expelled by red heat; yet the excess can be easily disengaged in a low temperature, and thus tends to nourish the growing crops.

It is not necessary to dilate farther upon the properties of calcareous earth, as, at the first glance, it must be recognized as a highly valuable ingredient; and accordingly, wherever agriculture is carried on with spirit, it is eagerly sought after, though at a high price. This earth exists in immense abundance among the solid strata of our globe, mostly without any foreign mixture, except the acids with which it combines; but occasionally is blended also with the other primitive masses. With carbonic acid, which in a previous letter I particularly described, it forms the most frequent compounds—denominated carbonates of lime—and assumes a variety of names and appearances, and even possesses distinct properties. Spar, marble, stalactites, limestone and chalk are all varieties of this combination. With the sulphuric acid (which is composed of sulphur and oxygen) it forms plaster of paris—a rock well known, as it is profusely scattered by the hand of nature throughout this Province. Lime is, also, found mixed with clay,

and sometimes with sand, and then receives the appellation of marl, and which is valuable precisely in proportion to the quantity of this earth. Sea shells too derive their fertilizing qualities from the lime of which they are composed; and, without descending to farther particulars, it may be safely affirmed, that so necessary is calcareous earth in the composition of soils, that wherever nature has not blended it in their original formation, the agriculturalist should, though at great expense and much trouble, supply the deficiency.

IV. The last earth which has been found in soils, and that too in a much smaller proportion than the other three, is magnesia—a substance, with which every farmer must be acquainted, since it is commonly used as a medicine of the shops. Its properties are nearly analogous to those of lime, and were long supposed to operate in the same way. It has also a strong, though less affinity for carbonic acid, and often forms a constituent principle in limestone rock: but at present agriculturalists are divided about its usefulness as a manure; some of them holding it up as a poison to plants, and others supporting it by an appeal to experiments. It is not worth while to introduce my readers to this dispute; as I am uncertain whether our limestone contains any portion of magnesia; although its presence in the old country, upon accurate investigation, is found to be a very common occurrence. At all events, it is only pernicious when applied in an excessive dose; and this holds equally true with respect to lime, for these two earths should, in all cases, be used sparingly by the skilful cultivator.

By analyzing the various soils and subsoils, they have been found to resolve themselves into one or all of these primitive earths; and their barrenness and fertility have, in no small degree, depended on the mixing and assorting of these ingredients. Loam is by no means a distinct body, possessing in itself appropriate and marked charac-

ters, as many of our farmers, with whom I have conversed, ignorantly suppose; but is a combination of clay, sand or calcareous matter: and as we advance in science, and men among us arise, versed in conducting such investigations, the component parts of our rich intervals and uplands will be ascertained and given to the public. The very diversity, which exists among what are accounted loams, is a decisive proof of what I advance. Some of them we denominate clayey, from the excess of argillaceous matter, others open and light, from the preponderance of sand. In fact, these two original ingredients seem capable of being compounded in such an infinite variety of ways, as to give occasion to that diversified texture of soils met with in all countries and situations; and are contrived to counteract each other's qualities, that by their union, they might furnish the basis of that beautiful and splendid creation of flowers and plants, of shrubs and trees, which decorate the face of nature, and charm us by a sweet assemblage of all that is gay and soft in colouring, with all that is elegant and attractive in design.

Besides these four primitive earths, which constitute equally the soil and subsoil, the upper of these, or the mould as it is sometimes called, contains the putrid relics of organized substances, that have grown and decayed upon it, or have been conveyed thither in the progress of cultivation. The decomposition of these is the proximate cause of fertility; and the richness of soils bears reference to the relative quantities. The residual earth remaining after the process of dissolution, is extremely light in weight, and always of a blackish colour. It is owing to this, that a garden, which has been under long continued culture, approaches to a black tinge, progressively deepening according to the abundance of this matter.

In addition, all soils lying in the territories of an old country, are found to contain various chemical compounds, mineral salts, and metallic oxids; some of which are bene-

ficial, others harmless, and a few injurious to vegetation ; and which either pre-existed in the strata, from which the surface has been formed, or have been carried to it by subterraneous springs, or by foreign causes operating in the course of past ages. These chemical bodies are so few in number, so small in quantity, and generally of such unimportant efficacy in vegetation, that it would be preposterous, considering the present state of knowledge, to dilate upon them in these elementary letters. The most frequent are, Epsom and common salt, combinations of potash, lime, and magnesia, with the acids, and the oxid of iron—which is just the rust produced by exposing this metal to the action of the air. It is this oxid, which gives the brown and reddish colour, as well as the intermediate shades, to sand and clays.

It seems plain, that considerable advantages must be derived to the practical farmer from analyzing the different kinds of soils, from comparing the proportion of the earths in the productive, with those found in the barren, from studying the separate effects of these ingredients, and from all these results, deducing the most skillful plan of procedure in effectuating permanent improvements. Chemists of great fame have embarked in this line of research, and vast progress has been made by their elucidations. They have laid down rules to assist and guide the agriculturalist in this department of the arts ; they have exemplified the different processes to be performed, and even described the instruments necessary for an elaborate, and accurate analysis.

There is, however, a less laborious and less intricate analysis of soils, defective as our knowledge of chemistry may be, which is placed within our reach, and which may in time lay the foundation of more perfect and accurate methods.

In the field to be examined, take earth a little below the surface, from four separate places, about 1-4 lb. avoirdu-

pois from each. Expose it to the sun, or before the fire, till it is completely dry, and turn it over frequently that it may be well mixed together. From the heap take exactly four ounces, and pass this through a fine sieve, which will allow all the particles of sand and gravel to escape, but hold back stones, small fibrous roots, and decayed wood. Weigh the two parts separately, and take a note of each. The stones and other bulky materials are then to be examined apart from the roots and wood. If they are hard and rough to the touch, and scratch glass easily, they are siliceous or flinty; if they are, without much difficulty, broken to pieces by the fingers, and can be scraped by a knife to powder, they are aluminous or clayey; or if, when put in a wine glass, and common vinegar poured upon them, small air bubbles ascend to the top of the liquid, they are calcareous. The finely divided matter, which ran through the sieve, must next undergo the test of experiment. After being weighed, agitate the whole in water, till the earth be taken up from the bottom and mechanically suspended, adding water till this effect be produced. Allow the mass then to settle for two or three minutes, and in that time the sandy particles shall have all sunk to the bottom. Pour off the water, which will then contain the clay in suspension with the insoluble earth arising from animal and vegetable decomposition. The sand should first be attended to; and if from inspection it be thought either siliceous or calcareous in its nature, the requisite tests may be instantly applied.—By this time the mixture will have deposited at the bottom of the vessel the clay, and other earths, with the insoluble animal and vegetable matter. After pouring off the water, dry the sediment, and apply a strong fire by placing it on the bottom of a pot heated to redness, and the animal and vegetable matter will burn and fly off in aeriform products. The remainder lying in the bottom will be found to consist of clay,—magnesia or lime. To obtain accuracy, another 1-4 lb. of earth should be

taken from the same heap, and the whole process gone over, a second, a third or even a fourth time, that the operator may rectify any blunders he had previously committed, and be satisfied as to the results of his experiment. He should provide himself with a pair of fine scales and a set of weights, divided at least into ounces and drachms. Although vinegar will detect lime by effervescence, it does not dissolve it so effectually as the nitric or muriatic acids; small quantities of which may be procured from the druggists at no great expense. *Acadian Recorder.*

AGRICULTURAL INTELLIGENCE.

THE Massachusetts Agricultural Society received in May last, a *keg of Poland wheat* through the instrumentality of Gen. Henry H. Dearborn. They also received a parcel of the same species of grain, through the instrumentality of Amos Binney, Esq.

The Hon. William Gray also transmitted to their care, a "quantity of grain imported from Leghorn, and said to be the seed of that which produces the straws, from which are made the straw hats, so much esteemed in this country."

The society have caused the seeds to be distributed according to the wishes of these gentlemen. The result, when known, will be communicated to the public. From attentions such as these, by public spirited gentlemen, connected with commerce, agriculture must derive great and permanent benefits. Those, who make the Trustees of the Massachusetts Agricultural Society the medium of such attempts to serve the best interests of the country, may rely upon their zealous co-operation in promoting their patriotic purposes.

AN ACT FOR THE ENCOURAGEMENT OF AGRICULTURE
AND MANUFACTURES.

SECTION 1. *Be it enacted by the Senate and House of Representatives, in General Court assembled, and by the authority of the same, That every incorporated agricultural society within this Commonwealth, which shall have raised by subscription of individuals, or which may hereafter raise by such subscription, and put out to interest, on public or private security, the sum of one thousand dollars, as a capital stock, appropriated for the uses of said society, shall be entitled to receive, in the month of October, annually, out of the Treasury of this Commonwealth, the sum of two hundred dollars; and also a proportionable sum, annually, for any greater sum which they should so subscribe and put out to interest, as a capital stock: Provided, always, that no agricultural society shall receive, by virtue of this act, within one year, any greater sum than six hundred dollars.*

SEC. 2. *Be it further enacted, That any agricultural society, formed within any county or counties in this Commonwealth, in which no incorporated society at present exists, which shall hereafter be formed, and which shall raise, put out to interest, and appropriate a capital stock, not less than one thousand dollars, for the uses of said society, shall be entitled to receive, on application to this Legislature, an act of incorporation, in usual form, and with customary rights and powers; and also be entitled to take advantage of the privileges hereby secured to the other agricultural societies, on complying with the terms and provisions of this act: Provided, always, that no agricultural society, hereafter formed as aforesaid, shall be entitled to the benefits of this act, unless the same be formed in a county, or in an association of counties, including a population of thirty thousand inhabitants.*

SEC. 3. *Be it further enacted,* That for the purpose of availing themselves of the advantages of this act, it shall be the duty of every agricultural society, in the month of October, annually, to file in the Secretary's Office of this Commonwealth, a certificate, signed by the President and Treasurer of such society, specifying, under oath, the sum actually subscribed, put out to interest, and appropriated as a capital stock, conformably to the provisions of this act; and the Governor of the Commonwealth is hereby authorized, upon the filing of such certificate, to issue his warrant upon the Treasurer thereof, for the sum to which such agricultural society shall thereupon be entitled, under this act.

SEC. 4. *Be it further enacted,* That it shall be the duty of every incorporated agricultural society, which shall avail themselves of the benefit of this act, to annually offer, by way of premiums, to apply otherwise, at their discretion, for the encouragement or improvement of agriculture or manufactures, a sum equal to the sum annually received out of the Treasury of the Commonwealth, by virtue of this act, and also shall transmit to the Secretary's Office of this Commonwealth, in the month of January, annually, an official statement of their proceedings, in relation to the expenditure of such monies, specifying the nature and objects for which such premiums have been offered, and such encouragement applied, and to whom they were awarded; and accompanying the same with such general observations concerning the state of agriculture and manufactures in the Commonwealth, as they may deem important or useful. And all surplusses of monies, arising from premiums offered, and not obtained, or paid, shall be put out to interest, and added to the capital stock of each agricultural society.

SEC. 5. *Be it further enacted,* That it shall be the duty of every incorporated agricultural society, to offer annually, such premiums and encouragement, for the raising and preserving oaks, and other forest trees, in such

manner, and on such terms, as to their discretion shall seem best adapted to increase and perpetuate an adequate supply of ship timber, within this Commonwealth.

SEC. 6. *Be it further enacted*, That nothing in this act shall be considered to extend to any agricultural society, which has been, or which hereafter may be incorporated in any town, or for any circle of territory less than a county.

SEC. 7. *Be it further enacted*, That this act shall continue in force for five years, and no longer.

[Approved by the Governor, February 20, 1819.]

LIST OF IMPLEMENTS BELONGING TO THE MASSACHUSETTS SOCIETY FOR PROMOTING AGRICULTURE, NOW IN THEIR HALL AT BRIGHTON.

Cooke's Patent Drill and Horse Hoe, for sowing all kinds of grain and turnips, in rows of 9, 12, 18, 24, and 27 inches, and after to hoe the crop. It is considered one of the most important implements in English husbandry. First cost, 18 guineas.

Couch's Grass Rake and scarificator.

Wier's Improved Family Mill, with French burr stones, to be used by hand. Cost, 18 guineas.

A Scotch Swing Plough, with chain, draft, and a drill-box, to attach thereto.

An Expanding Hand Hoe, with cast iron mould plates.

A Northumberland Turnip Drill; and may also be used for carrots. An excellent implement in saving labour and seed.

A Breast Hoe for paring sods.

A Northumberland Hoe Plough, with circular coulters and hoes expanding. It much resembles *Sinclair's* Flemish Binot.

An English Plough, presented by ——— Lambert, Esq. of Roxbury.

A Hand Mill for cracking beans, corn, &c.

A Threshing Machine, invented and patented by Elihu Hochkiss, of Brattleborough, Vermont, which obtained the Society's premium in 1813, and of which they have purchased the patent right for the use of this State. Apply to the Corresponding Secretary.

A Straw Cutter, invented and patented by Mr. Hochkiss, which obtained the Society's prize in 1815, and of which they have the patent right for the use of this State.

A Simple Winnowing Machine, invented by John James, 3d.

Two large Spanish Milk Pans, sent to the Trustees by Mr. Barrell, the American consul at Malaga.



CATALOGUE OF BOOKS BELONGING TO THE MASSACHUSETTS AGRICULTURAL SOCIETY'S LIBRARY.

Agriculture, communications to the Board of. Second edition, 1 vol. 4to. London, 1804.

American Husbandry : containing an account of the soil, climate, productions, and agriculture of the British colonies in North America and the West Indies. By an American. Two vols. 8vo. London, 1775.

Anderson, James, Essays relating to agriculture and rural affairs. Fourth edition with additions, 3 vols. 8vo. London, 1797—98.

Anderson, James, Recreations in agriculture, natural history, arts and miscellaneous literature, 8vo. London, 1798—1801.

Banister, John, A synopsis of husbandry : being cursory observations in the several branches of rural œconomy, 1 vol. 8vo. London, 1799.

Banks, Sir Joseph, A short account of the cause of the disease in corn, called by farmers the blight, the mildew, and the rust. Second edition, with a letter to Sir J. Banks

on the origin of the blight, &c. By T. A. Knight, 8vo. 39 pages. London, 1806.

'Bath and West of England Society for the encouragement of agriculture, arts, manufactures, and commerce; letters and papers on agriculture and planting, &c. Selected from the correspondence of the Society. Thirteen vols. 8vo. 3d wanting. Bath, 1792—1814.

Billingsley, John, General view of the agriculture of the county of Somerset. One vol. 8vo. Bath, 1797.

Blith, Walter, The English improver improved, or the survey of husbandry surveyed; the 3d impression augmented. One vol. 4to. London, 1652.

Bradley, R., A general treatise of husbandry and gardening. Two vols. 8vo. London, 1726.

Buc'hoz, J. P. Histoire des Insectes nuisibles et utiles à l'homme, aux Bestiaux à l'agriculture et aux Arts, 2 vols. 12 no. Paris, 1809.

Chambert, L. Essai sur l'Amelioration des principaux Animaux domestiques, 2 vols. 8vo. Paris, 1815.

Columella, L. Junius Moderatus, of husbandry, in twelve books, and his book concerning trees. Translated into English, with illustrations from Pliny and others, 1 vol. 4to. London, 1745.

Darwin, Erasmus, Phytologia; or the Philosophy of Agriculture and Gardening, &c. 1 vol. 8vo. Dublin, 1800.

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Daubenton, M., Advice to shepherds and owners of flocks, on the care and management of sheep, 8vo. Boston, 1810.

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Duhamel du Monceau, *Practical treatise of husbandry.* One vol. 4to. London, 1759.

Duhamel du Monceau, *Traité d'arbres fruitiers: contenant leur figure, leur description, leur culture, &c.* Two vols. 4to. Paris, 1768.

Dundonald, Earl of, *A treatise shewing the intimate connexion between agriculture and chemistry.* One vol. 4to. London, 1795.

Elkington, Joseph, *An account of the most approved mode of draining land, according to the system practised by, with an appendix, &c. drawn up for the consideration of the board of agriculture.* By John Johnstone, 1 vol. 4to. Edinburgh, 1797.

Erskine, John Francis, *General view of the agriculture of the county of Clackmannan,* 4to. Edinburgh, 1795.

Essays, Foreign, on agriculture and arts. One vol. 8vo. London, 1766.

Evelyn, John, *Silva, or a discourse of forest trees, with an historical account, &c. of standing groves, with notes.* By A. Hunter—a new edition; to which is added the *Terra*, a philosophical discourse of Earth. Two vols. 4to. York, 1786.

Farmer, the Complete, or general dictionary of husbandry. Folio, 1 vol. London—2 copies.

Farmer's Magazine, The, a periodical work devoted to agriculture and rural affairs. Nine vols. 8vo. Edinburgh, 1802—8.—2d, 4th, and 8th vols. wanting.

Farmer's Calender, The new, or monthly Remembrancer for all kinds of country business, &c. 8vo. Second edition. London, 1801.

Forsyth, William, *A treatise on the culture and management of fruit trees, with an introduction and notes.* By William Cobbett. One vol. 8vo. New York, 1802.

Gilbert, F. H., *Instruction sur les moyens les plus propres à assurer la propagation des Bêtes à laine de race*

d'Espagne et la conservation de cette race dans toute sa pureté. nouvelle edit. 8vo. Paris, 1800.

Gilbert, F. H., Instruction sur le claveau des Moutons, 8vo —51 pages.

Hawes' Useful and practical observations on agriculture. One vol. 12mo. London, 1783.

Hill, Thomas, A treatise of fruit trees. Third edition. One vol. 8vo. London, 1768.

Houghton, John, A collection for the improvement of husbandry and trade, revised, corrected, and published with preface, &c. By Richard Bradley, 4 vols. 8vo. London, 1727—8.

Humphreys, David, A discourse on the agriculture of the state of Connecticut, &c. 8vo. New Haven, 1816.

Hunter, A., Geographical essays, 6 vols. 8vo. York, 1803—4.

Knight, T. A., A treatise on the culture of the apple and pear, and manufacture of cider and perry, with an appendix. Fourth edition, 1 vol. 12mo. London, 1813.

Lasteyrie, C. P., Histoire de l'introduction des Moutons a laine fine d'Espagne dans les divers états de L'Europe et au cap de bonne espérance, 8vo. 1 vol. Paris, 1802.

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Lawrence, John, A general treatise on cattle, the ox, the sheep, and the swine. Second edition, 1 vol. 8vo. London, 1809.

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London, John, on forming country residences, &c. Two vols. 4to. London, 1806.

Lowe, Robert, General view of the agriculture of the county of Nottingham. One vol. 8vo. London, 1793.

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Markham, G., *A way to get wealth: containing six principal vocations or callings.* Thirteenth edition corrected and augmented, 1 vol. 4to. London, 1676.

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Young, Arthur, *A six months' tour through the north of England*, 2d edition, 4 vols. 8vo. London, 1771.

Young, Arthur, *The farmer's letters to the people of England*, containing the sentiments of a practical husbandman. Third edition, 2 vols. 8vo. London, 1771.

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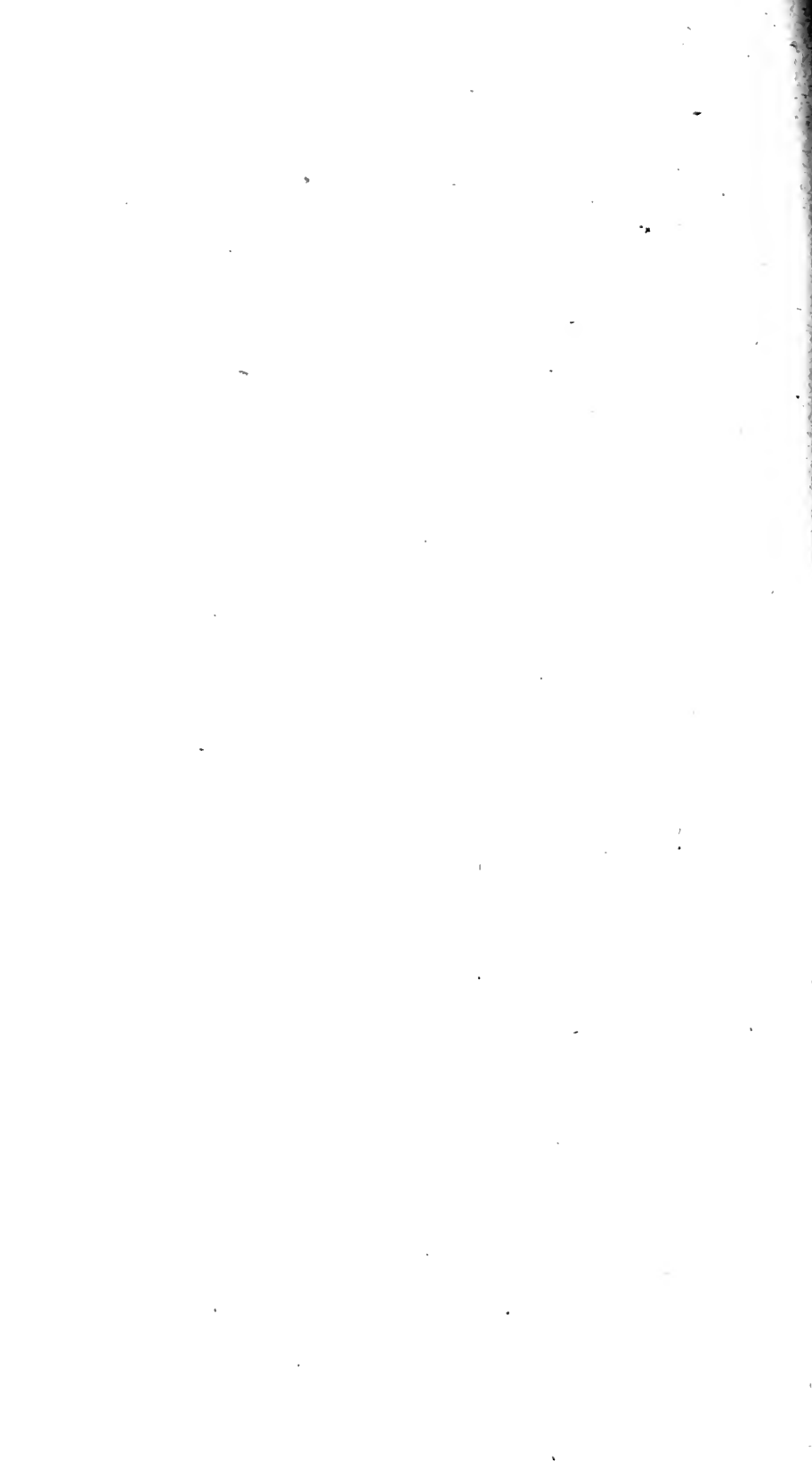
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