TRANSACTIONS.

TRANSACTIONS

OF THE

AGRICULTURAL SOCIETIES

OF MASSACHUSETTS,

FOR THE YEAR 1847.

COLLATED FROM THE ORIGINAL RETURNS,

BY WILLIAM B. CALHOUN,

SECRETARY OF THE COMMONWEALTH.

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ADVERTISEMENT.

The Returns of the various agricultural societies in the Commonwealth, for the year 1847, are very fully presented in the following pages. The Digest has been made under the efficient and intelligent agency of the same gentleman—Hon. A. W. Dodge, of Hamilton—who prepared the two preceding volumes. These annual volumes, thus made up, are increasing regularly in importance and value; and the interest awakened by them is evidently very greatly enhanced throughout the community.

If all the societies in the Commonwealth would make strenuous efforts to present ample reports of their doings, a volume might annually be furnished, which would hold the same rank among the farmers which the annual volume of law reports holds amongst lawyers. It would carry with it authority. What has already been accomplished abundantly indicates, that this hope will not fail of being eventually realized.

What is more especially needed, is a copious and minute detail of the experience of farmers in the raising of crops, and in the general management of their farms. In the making of statements for the records and returns of the societies, there is no danger of being too minute. The fault usually alleged against such statements, is, that many details are omitted which are indispensable to the forming of correct judgments concerning results. It very often happens, in giving accounts of valuable crops, that the accompanying descriptions of the soil are exceedingly loose; and yet this is a point of vital import-

ance. The characteristics of the soil in such cases should be furnished with great fidelity.

The absence of care and thoroughness of detail, in narratives of the successful management of crops, often leads to sad disappointments, by reason of the omission referred to, in cases where the attempt is made to follow the guidance of such narratives. A single element of the soil overlooked, or a deficient description of manures used and their management,—these are not unfrequently sufficient to defeat the very purpose intended by the case reported. No material fact, therefore, should ever be neglected or passed over slightly.

In the transactions of the Essex County Society, to be found in the following pages, a very happy and gratifying illustration of the force and importance of these remarks, will be seen in the essays, which are furnished on several interesting topics of farm-culture. This feature in the proceedings of the Essex Society, it is greatly to be hoped, may approve itself to the judgment of all the other societies, and be hereafter extensively imitated. How can the funds of these societies be turned to a better account than by the award of liberal premiums for accurate, condensed, and, at the same time, comprehensive essays on the various branches of cultivation?

Remarks, substantially of the same character, may be made in reference to the reports of committees at the cattle-shows. As the law now stands, the returns of the doings of the societies may be made at any time before the 10th day of January. Ample opportunity is therefore afforded to committees, to mature and perfect their reports; so that the grounds, on which the awards of committees are made, may be leisurely and carefully set forth, accompanied by the detailed statements of competitors. It is thus that a great amount of practical and valuable information may be furnished for the benefit of the farmers of the Commonwealth. This suggestion cannot be urged with too much earnestness upon the officers of the agricultural societies, having at heart, as they all have, the welfare of the State in this, its great interest.

The present volume contains large selections from the addresses delivered at the anniversaries of the various societies, with the valuable address of Professor SHEPHARD, at Springfield and Northampton, entire. It has been found impracticable to obtain the addresses before the Bristol and Barnstable Societies. This portion of the transactions of the societies, will not be regarded as the least valuable part of the volume. Many points are touched and examined, of vital importance to the farmer. The subject of an agricultural school, now attracting extensively the attention of the community, is amply and ably discussed, and will afford essential aid in maturing correct opinions on so important a point of public policy. Herein is evinced the gratifying progress, which is now making in the advancement of agricultural science to its true position in an enlightened community.

SECRETARY'S OFFICE,
March 24, 1848.

ABSTRACT.

MASSACHUSETTS SOCIETY FOR PROMOTING AGRICULTURE.

The President and Secretary of the Massachusetts Society for Promoting Agriculture, in obedience to the requisitions of the act of 11th of March last, make return to the secretary of the Commonwealth of the transactions and expenditures of said society, as appears on their records of the last year.

The whole income of their funds, and their active duties as trustees, have been devoted to the furtherance of the objects set forth in their two preceding annual returns, viz: that of rearing a breed of cattle (particularly milking cows) to the highest perfection, by the importation, judicious selection, and distribution of the best stock which they were enabled to procure in Europe.

The reports, therefore, required by the act to be returned to the secretary of the Commonwealth, are the reports of Mr. Phinney, one of the board of trustees, to whom the care of the imported stock, under the supervision of a committee of the board, has been entrusted. Although these reports are made monthly, the substance of them has been condensed by Mr. Phinney into his report for December last, which is returned herewith. The model horse, which was the subject of a lecture

delivered by Dr. Warren, one of the trustees, at the request of the legislative agricultural society, last spring, is in the hall of the medical college, and also the skeletons of the horse and cow, subject to the order of the trustees.

JOHN C. GRAY,

President of the Mass. S. for P. A.

BENJ. GUILD,

Rec. Sec'y of the Mass. S. for P. A.

Boston, January, 1848.

Mr. Phinney's Report.

The subscriber, having in keeping the stock of cattle owned by the Massachusetts Society for the Promotion of Agriculture, submits the following report:—

It is now little more than two years since the Society, at an expense of $2500, imported ten head of the Ayrshire and North Devon breed of cattle, five of each, with a view of promoting the interests of the farmers of the whole Commonwealth by enabling them to improve their stock. The advantageous circumstances under which the selection was made, have been fully stated in a former report. They were all placed in the care of the subscriber, on his farm at Lexington, where they now remain. Nine of the original importation are now living, one of the Ayrshire cows having died soon after calving, in the summer of 1846. In October, 1846, the Society purchased, at the sale of Capt. Randall's stock in New Bedford, his imported Ayrshire cow "Young Swinley," and her heifer calf "Gowen," then nearly three years old, and in calf by Capt. Randall's Ayrshire bull "Roscoe."

From the whole of this stock, the Society have now thirteen descendants, viz: ten bulls and three heifers, of the pure blood.

A fine bull-calf from the Hon. John C. Gray's superior Ayrshire cow "Maggie," that was out of "Young Swinley," was presented to the Society, in May last, by Mr. Gray, making in

all, fourteen young animals of the full blood, that are to be distributed among the several County Agricultural Societies, at a suitable age. In addition to these, there are two calves, a bull and a heifer, from native cows crossed with the imported breeds. Three of the imported cows are expected to drop their calves in January next, and six others within the six following months.

The imported North Devon bull, "Bloomfield," that, a year ago, was laboring under a severe attack of bronchitis, a disorder which, in most cases in Europe, proves fatal, is now, by the skilful management of Dr. Wood, of Lowell,—a distinguished veterinary surgeon,—apparently well, and in fine condition. The pedigree of this bull shows him to be of the very best blood that could be obtained in England. His loss would therefore have been a serious misfortune. His stock, which consists of two bull-calves, now nearly a year old, are fine animals and give promise of being equal to any of this beautiful breed of cattle.

One of the young North Devon bulls, out of the North Devon cow, "Honeymoon," while at pasture in August last, received an injury in the vertebræ of the neck, occasioned by sporting with other bulls, of which he died.

The first calf of the young Ayrshire cow, "Gowen," purchased of Capt. Randall, as above stated, in consequence of a deficiency of muscular strength in his hind-legs, was considered not worth the expense of raising. The second calf by the Ayrshire bull, "Prince Albert," now about a month old, is a very perfect animal.

The imported Ayrshire cow, "Mirlay," from which the Society have now two beautiful heifers, and which was considered the most valuable of the flock, was, in June last, perceived to be troubled with a difficulty of breathing, which resulted in a most inveterate case of bronchitis. The difficulty of respiration increased to such a degree, that it was found necessary to open the wind-pipe and insert a tube, by the aid of which she was enabled to breathe. This was done by Dr. Wood; and, with the aid of other powerful appliances in the region of the bronchial tubes, the cow is relieved and in a fair way of recovery. With this exception, the stock is now all in fine health and condition.

The distribution of the descendants of the imported stock, in a way that would be most likely to carry out the original intention of the Society, by allowing the whole of the Commonwealth to share in its advantages, had for some time engaged the deliberate consideration of the trustees. To effect this desirable object, and to place within the reach of every farmer the opportunity of improving his stock of cattle with as little inconvenience, and at as low a charge, as possible, has been the earnest desire of the trustees: knowing the reluctance with which most farmers part with their hard earnings for what, even, they may be made to acknowledge may be a positive good, and much more when the object to be attained is of future, and in the smallest degree of doubtful utility, the trustees were desirous of removing as far as possible every obstacle on the score of expense.

With these objects in view, the trustees, at their meeting in October last, decided to make a gratuitous offer of all the offspring of the Society's stock of cattle to the several County Agricultural Societies, according to the dates of their respective acts of incorporation, by placing in the hands of the officers of the respective County Societies, one or more of the animals, when at a suitable age, for the use of the counties in which they may be respectively located. By the annexed circular, it will appear that the trustees reserve the right of retaining as many of the offspring as may be necessary to keep up the number of the original purchase, and also of reclaiming any one or more of them that may be considered necessary to supply the loss of any one or more of that original number, or for any other desirable purpose. Hoping that each of the County Societies would lend a cheerful coöperation with the State Society, in every measure that might tend to promote the interest, and best subserve the good of the whole, the trustees believed there would be no objection, on the part of the County Societies, to receiving the animals with this reservation.

The whole number of full-blood animals owned by the State Society, including the original purchase and their descendants, is now twenty-five. To this number, nine more, it is expected, will be added in the course of a few months. These, with their descendants, it is believed, will, within three years from this time,

enable the trustees to place in the hands of each of the County Societies at least half a dozen of the full-blood animals, equal to any that can be found in this or any other country. The result of this liberal distribution of the best stock among the farmers of Massachusetts, aided by the skill and careful management of the County Societies, by increasing the product of the dairy, and the value of farm stock generally, will, it is believed, be of almost incalculable benefit.

Some evidence of the value of the Ayrshire, as a dairy stock, and the estimation in which they are held by farmers, may be gathered from the importations of that breed in years past. In 1836, the State Society imported three cows and a bull of this breed. One of the cows was placed in the care of the subscriber. When twelve years old, in the month of January, four months after calving, she yielded ten pounds of butter per week, when kept on hay and one peck of carrots per day. The calves of either sex, at a year old, found a ready sale at $100 each. A half-blood, at four years old, produced by a cross of the Ayrshire bull with a good native cow, yielded twenty-one quarts of milk per day, for some weeks after calving. The price at which half-blood cows of three and four years old have been sold, has been from forty to sixty dollars, while the native breeds of the same age were selling for from twenty to forty dollars. In some instances, the owners of heifer calves of the half blood, at only four weeks old, have refused to part with them for an offer of twenty dollars.

The Ayshire cow, "Young Swinley," imported about seven years since by Capt. Randall, as before stated, and now owned by the society, furnishes an instance of what may be done with a single cow, by way of improving the stock of the country. This cow, upon common keeping, yielded fifteen pounds of butter per week. Four of her descendants are known by the subscriber; "Maggie," owned by the president of this society; "Effy," owned by Mr. Wright, of Lowell; "Pink," owned by Mr. Lawson, of Dracut; and "Gowen," owned by the State Society. These are all first-rate cows, and give promise of being fully equal to the dam, and have given from one to four calves each. In a few years the trustees hope to be able to give

as good an account of the produce of each of their imported cows. In addition to the four cows above stated, the descendants of "Young Swinley," she has given birth to two or three valuable bull-calves, the youngest of which is owned by the society, and she is now in calf again by the society's Ayrshire bull, "Prince Albert."

I would now ask the advocates of our native stock, to the utter exclusion of all foreign breeds, where among all the celebrated milkers of native breed, they can point to a cow whose offspring will compare with that of "Young Swinley?" What has become of the famous "Oakes Cow," the "Nourse Cow," and a host of other *accidental* good cows, descended from a medley of all races,—unsurpassed, it is acknowledged, in their yield of milk or butter by any of the imported cows? But where are they? All found their way to the shambles. What has become of their descendants? All gone the same way; not a solitary one of them found to be worth the expense of rearing.

Thousands of dollars have been paid within this Commonwealth for the express object of improving the dairy stock; and what has been the result? The hoped-for improvement has been looked for in vain. Not an instance is on record where the extraordinary qualities of the dam have been transmitted to the progeny, except by the crossing with some pure blood of a foreign breed.

Should the opposers of the introduction of the foreign breeds of animals reason philosophically upon the subject, and base their conclusions upon the immutable laws of animal physiology, they would readily understand why their native cow, in whose blood there are blended many of different races of good and bad qualities, might, and in all probability would, produce a worthless calf. They might also, by this mode of reasoning, be induced no longer to question the expediency of expending a few thousand dollars, in procuring a *certain means* of improving the stock of the whole Commonwealth.

And now, while the Massachusetts Society are thus endeavoring to furnish the farmer with the means of improving the quality and enhancing the value of his stock, they take the liberty of reminding him of the duty that devolves upon him, of doing

all in his power to aid in the promotion of this desirable object. The cleanliness, comfort and well-being of his cow, furnished by a kind Providence to be the friend and nurse of the whole civilized family of man,—the cow, which contributes so much to the necessities of the poor and the luxuries of the rich,—should be the object of the farmer's unremitted care and solicitude.

Respectfully submitted by

E. PHINNEY.

FORM OF CIRCULAR.

To the Secretary of the *Agricultural Society.*

DEAR SIR,—In pursuance of the authority given us by the trustees of the Massachusetts Society for Promoting Agriculture, we offer to the acceptance of your society a pure-blood of the breed, subject to the conditions stated in the enclosed receipt, which the trustees, for public considerations, have deemed it necessary to annex.

The will be delivered at Mr. Phinney's place, in Lexington, to any person who shall produce the receipt signed, on behalf of your society, by yourself, or any person duly authorized. Please signify to Mr. Phinney, by letter directed to him at "East Cambridge," as soon as may be convenient, whether your society will accept the same.

We are, respectfully,

Your Obedient Servants,

Committee for the Distribution of Stock.

FORM OF RECEIPT.

Lexington, 184 .

Received on account of the Agricultural Society, from the trustees of the "*Massachusetts Society for Promoting Agriculture*," one full-blood of the breed, on the following conditions, viz :—

1st. That the said shall be kept within and for the use of the county of .

2d. That the said shall not be under the age of two years and six months.

3d. That this society will annually make return to the secretary of the said Massachusetts Agricultural Society, of the condition of the said , the number and condition of the full-blooded progeny, and the number, and, as far as possible, the character of the stock produced by a cross of the pure-blooded bull with native or other cows.

4th. That if at any future day, in the opinion of the trustees of the Massachusetts Society for Promoting Agriculture, the distribution of the offspring of the imported stock over the Commonwealth would be more effectually promoted by the return of the said animal to the State Society, whether it be to supply the loss of any of the original stock, or from any other cause, the said animal shall be subject to the said trustees, to be returned to them; the county societies being considered as coöperating with the State Society for the best advancement of the interest intrusted to them respectively by the government.

ESSEX AGRICULTURAL SOCIETY.

This Society held its thirtieth anniversary at Lynn, on the 29th day of September last. It was generally considered as one of the best fairs ever held by the Society. The ploughing match was contested with great skill, and the work exceedingly well performed. Twelve double, and eight single ox-teams, and eight horse-teams, were entered for premiums, and all ploughed the lots assigned them. The display of fruits exceeded the expectations of the Society, there being a greater variety and larger number shown, than at any former exhibition. It was gratifying to observe so much interest manifested by many of the visitors, as well as contributors, in the cultivation of fruit. The other departments of the exhibition were well filled.

By the kindness of Mr. Phinney, seven animals of the stock of the State Society were present at the show, and commanded the admiration of all who are judges of fine stock. For the purpose of bringing out a larger number of animals on the day of exhibition, Charles A. Stetson, Esq., of Lynn, has generously placed at the disposal of the trustees one hundred dollars, which has been added to the list of premiums on neat stock, for the ensuing year.

The address was delivered by Thomas E. Payson, Esq. of Rowley.

Milch Cows and Heifers.

The number of cows and heifers was unusually large, and they were apparently of a very superior quality. The committee award,

To Abner Newhall, of Lynn, for his cow, 8 years old, the first premium of $10.

To A. Brackett Lord, of Beverly, for his cow, 8 years old, the second premium of $7.

To Samuel King, of Danvers, for his cow, 7 years old, the third premium of $5.

To John Stone, of Marblehead, for his starred cow, 9 years old, the fourth premium of Colman's European Agriculture.

E. G. Berry, of Danvers, exhibited two very fine three years old heifers; and one two years old, now forward with calf,—of which, a statement is given of the produce of those in milk, which was very large for cows of that age.

The committee, in awarding these premiums, have endeavored, as far as practicable, to carry out what they considered the views of the trustees, and of the Society, by aiming to reward the skill of the owners of cows and heifers, in training and keeping them in the best and most economical manner, rather than to reward them for their good fortune in being able to find and purchase those already trained and expensively fed by others. For this reason, where there were two animals equally balanced as to merit, the one purchased, and the other raised and trained by the claimant himself, they thought it their duty to give the preference to the latter.

It is important that the best breeds of cows should be sought, and no less important that they should be properly trained up and well fed. All may well know, that one good cow is worth much more than two ordinary ones, and even cows of good breeds have often been ruined by improper management while young. They, like some of the human race, frequently contract vicious habits in early life; they sometimes learn to be unruly by being in bad company, or enclosed with bad fences; they often early learn to push with the horns, and become uneasy, and troublesome to milk. They should be carefully and gently used; they will, thus used, better give down their milk; for this reason, the gentle female hand is often much more appropriate for this purpose than that of the opposite sex. Cows should be milked quick, and milked clean, or they will soon shrink in their milk, and the best be thus reduced to ordinary cows. Our female friends will pardon us for saying, that it is considered one of the most valuable accomplishments among the females of

the farmer's family, to be well taught to milk the cows, as well as to be able to perform the more delicate employments of the parlor, and other domestic duties.

TEMPLE CUTLER, *Chairman.*

Abner Newhall's Statement.

The cow which I offer for premium is eight years old. She had her last calf December 1st, 1846, which was killed December 7th, 1846: her time for another calf was the 8th of December next, but by some accident she lost it in August. She has given milk as follows:

From December 7th, 1846, to the present time, I have kept an account of her milk by weighing night and morning; below is the result:

From December	7th to 31st,	888$\frac{3}{8}$	pounds
" January	1st to 31st,	1323$\frac{5}{8}$	"
" February	1st to 28th,	1107$\frac{3}{4}$	"
" March	1st to 31st,	1096$\frac{3}{4}$	"
" April	1st to 30th,	962$\frac{1}{4}$	"
" May	1st to 31st,	941$\frac{1}{2}$	"
" June	1st to 30th,	997$\frac{1}{4}$	"
" July	1st to 31st,	925$\frac{1}{4}$	"
" August	1st to 31st,	707$\frac{1}{2}$	"
" Sept.	1st to 27th,	651	"
		9601$\frac{1}{4}$	" or

3840$\frac{1}{2}$ quarts of milk.

For keeping, during the winter, in addition to hay, I fed her with carrots to the amount of twenty-five bushels, and I also gave her four bags of shorts: during the summer she has nothing but grass, and rather short feed.

Lynn, September 28th, 1847.

A. B. Lord's Statement.

The cow I offer for premium, is eight years old. She calved the 22d of June, and has given milk as follows:

From June 25th to July 25th,	1205	pounds.
" July 25th to Aug. 25th,	1166	"
" Aug. 25th to Sept. 25th,	1126	"
Total,	3497	lbs.

We have made 96 lbs. butter in three months, besides the milk for the family of five persons, and supplying her calf two months. Also sold her morning's mess four times. We have made 31 lbs. butter from September 1st to the 25th. She has not been dry for eighteen months. Her keeping has been poor grass-feed and two quarts of shorts a day, since August 15th.

Beverly, September 28th, 1847.

Samuel King's Statement.

I exhibit for premium my red cow, 7 years old. She was reared by me from a native cow of superior qualities, which was driven to a Durham short-horn. She gave last year, on ordinary fall-keep, without any grain, from the time her calf was taken from her in September to the first of December, (after which no account was kept,) from thirteen to fourteen quarts of milk per day. Her milk is of superior quality; but as I sell it at this season of the year, its properties for butter have not been tested. She is perfectly gentle and orderly about fence, and will remain quiet without company.

Danvers, September 29th, 1847.

John Stone's Statement.

I offer, for examination, my starred cow of native breed, nine years old; she calved the 9th day of May, and the calf was sold on the 29th of the same month.

From the 1st to the 20th of June inclusive, she gave 311 quarts of milk, being a fraction over fifteen quarts and a pint per day. One week in June her milk was kept separate, and we made from it 1[illegible] ¼ lbs of good butter.

Her keeping until the first of August, was good pasture only. Through the month of August she was fed with green corn fodder. From the first to the twentieth of September she had good pasture only. She has never had meal; has always been kept well in the winter season on English hay, corn fodder, and some kind of roots. She has always been perfectly healthy, and has been owned by me six years.

Marblehead, September 28th, 1847.

Eben G. Berry's Statement.

I offer for inspection two three years old heifers, in milk; also one two years old heifer, that will be in milk about the 5th of November next.

One heifer has been in milk eleven months.

The product of her milk in the month of June, - 752 lbs.
" " " " at the present time, per day, 17½ "
" " " " 28 lbs. yield 1 lb. of butter.

The other heifer has been in milk seven months.

The product of her milk in the month of June, - 862½ lbs.
" " " " at the present time, per day, 20 "
" " " " 25⅜ lbs. yield 1 lb. of butter.

Their keeping through the season, has been good pasturing, with the addition of green-corn fodder, raised for that purpose, and fed to them at night.

North Danvers, September 29th, 1847.

On Sheep.

The committee, Moses Newell, chairman, reported that there was only one lot entered for premium or exhibition. They

were from the farm of James Marsh, of Danvers, and there was awarded him a gratuity of five dollars.

James Marsh's Statement.

I present for premium one buck and six native sheep, being a sample of my flock of fifty; in presenting which, I offer a few remarks. My attention to keeping sheep was first called up by the state of my pastures; they being bushy, and too rocky to plough without too much expense; my cattle would not keep them down without being kept too short. I found mowing did but little towards subduing them. About seven years since, I was induced to try sheep by way of experiment in subduing bushes, without much regard to the profits of the sheep. I accordingly procured six; the next year I increased my flock to fourteen; these I kept on a pasture that would have about half kept a cow: the sheep did well, the pasture did much better. I have since increased my flock to fifty, and intend still to increase it further. My method is to cut the bushes close, and keep as many sheep as will keep them down, and each year give them as many more as they will subdue in this way. I have nearly destroyed all the barberry, blueberry, blackberry, and raspberry bushes (and they were very plenty) in my pastures. The above-named bushes are favorite food for sheep: they will not suffer a green leaf to remain in their reach. My pasture, where they have run, produces more than double the feed it did before.

The two past years I have been trying an experiment on about twenty-five acres of land, principally covered with wood-wax and barberry bushes, (entirely worthless for neat stock,) which has exceeded my most sanguine expectations. While the sheep have done well, the wood-wax has decreased nearly one half. I think in a few years it will entirely run out.

I am fully convinced that most of the old mossy, bushy pasture, of Essex County, might be much improved by keeping sheep. My method would be not to keep them with neat stock, but keep as many sheep as the lot would pasture, and change

yearly, or as often as they performed their task of subduing bushes. The result would be a large increase of feed the years following the sheep.

My manner of treatment is to see them often, give them salt about once a week, keep them well sheltered from storms, and by a little feed and kind words to keep them as gentle as possible, so that I can call my whole flock as far as they can hear my voice. They will do well out as long as the ground is bare. I then yard them until spring, never allowing them to ramble over fields. I feed on meadow and salt hay, and wood-wax, until about yeaning, when they have good hay, and some grain, giving them a liberal supply of roots through the winter. My sheep thus far have much more than paid for their summer keeping, in the improvement of my pastures.

The principal profit, aside from the benefit to the pasture, is the lambs, which, for the three years past, has been as follows, viz :

1845	3 00	per head.
1846	2 90	do
1847	2 80	do

The wool averages about 1 00 per head. I have found the native sheep of a medium size the most hardy, and will bear short pastures much the best.

Danvers, September 26th, 1847.

On the Dairy.

The committee were highly gratified to witness the continued interest and improvement manifested in this very important part of domestic duty in this county ; and though many of our farmers' wives and daughters are entitled to much credit for the neatness, good taste, and skill which they have evinced in the management of the dairy, the committee are of opinion that there is yet room for much improvement in this branch of industry. Doubtless, many of the fair manufacturers of butter are more competent to give instructive suggestions respecting it than your

committe are: yet the place they occupy will be a sufficient apology for a few remarks upon a business in which this county, and almost every individual in the county, is interested. It is a trite adage, that "nothing is worth doing that is not worth well doing." If this maxim will hold good any where, it will in butter-making. Like Jeremiah's figs, the good is very good, but the bad too bad to be eaten.

Many bestow seven eighths of the time, care, and labor, in producing an article which is worthless for the table, which it would require to make butter which would do honor to any farmer's wife in the county, and to this society, too, if it were exhibited at our annual fair.

One of the greatest errors of butter-makers is thought to be that of suffering the butter-milk to remain incorporated with the butter. Butter which is not thoroughly wrought well, if not kept extremely cold, soon becomes rancid, and, as rancid butter is often found where there is no want of salt, we attribute it mainly to this cause. The remedy is, a little more patient labor.

It is of great importance that cream should be at the right temperature when churned. It is not uncommon in summer to hear the dairy-maid say, "the butter has come white and soft." This, we believe, is commonly in consequence of churning cream when it is too warm. Cream can be easily brought to a proper temperature by bringing the vessels which contain it in contact with ice, hanging them in a well, or putting them in a cold spring from 12 to 24 hours before churning. Any one who has not witnessed the advantage of cooling cream before churning, in warm weather, will be surprised at the result.

One other practical fault, is salting butter "to tastes," which are much more liable to vary than weights. One of the samples for the best product of butter presented for examination was too salt, and therefore did not receive the premium it would otherwise have been entitled to. "Too salt" however is not a *very* censurable fault, as the objection to butter of this kind can be obviated by using the precaution that a good old lady once suggested to a clergyman, who complained at her table that her butter was too salt. "Put the less of it in your mouth at a time," was her ready reply. One ounce of salt to a pound of butter

from the churn is in ordinary cases sufficient. Butter designed to be kept in a warm cellar will require more salt than if kept in an ice-house or cold cellar. Weighing will not preclude the necessity of exercising judgment; it is only an assistant. If the butter-maker should err in salting, let it be on the safe side, for we know of no apology to offer for a deficiency in salting or working butter. It soon becomes rancid, and is as revolting to the taste, as the scolding epithets or angry looks of the fair manufacturer would be to the eye or ear.

Fifteen samples of butter were presented for premium. The statement accompanying three of the samples was not such as the rules of the society require.

DAVID S. CALDWELL, *Chairman.*

Sub-Soil Ploughing.

The appointment of a committee, by the trustees, "on sub-soil ploughing and its effects," clearly indicates, on their part, a desire to acquire information on this interesting subject, rather than a confidence in their ability to communicate it.

Perhaps there is no branch of agricultural labor, about which so little is experimentally known among us. Our oldest *experts* have scarcely had *five* years experience;—and very few, more than *one* or *two* years.

We could readily select from English publications what is there said in relation to sub-soil ploughing, where it seems to be deemed almost indispensable to improved cultivation; but this is not the kind of information sought in our reports. We want the actual results on our own soil; we want our practical farmers so far to try the experiments themselves, as to determine whether or not it will be for their advantage, to continue the use of this instrument.

This has not yet been done by the farmers of Essex. Their *sub-soil ploughs*, like their *go-to-meeting clothes*, are kept for special occasions. They are not yet naturalized. They have not yet secured the entire confidence of their owners. There is

a jealousy respecting them. There is an apprehension, that the material which is started by their *deep penetration*, is not altogether well adapted to the growth of plants.

We have solicited and urged experiments on this subject; but with meagre practical results. We scarcely know the individual in the county, who has sub-soiled half a dozen acres in a year. We have many farmers who have hundreds of acres well adapted to this operation, but they are slow to apply it. And even those who have done something at it, have not so matured their labors as to be ready and willing to speak of them.

It should be remembered that, in conducting an experiment of this kind, it is not essential that it should be a successful one. If it is but judiciously managed, it may be quite as useful, if it demonstrates what is to be avoided as well as what is to be sought. This practice of sub-soiling is so extensive in other places, and has so much of plausibility connected with its theory, that it certainly commends itself to the favorable reception of all who are not entirely wedded to old notions and old practices. For ourselves, we do not pretend to speak of its good effects from our own observation. But we have heard of the benefits accruing from its use, in so many ways, from those whom we have always found worthy of confidence in other things, that we are disposed to give credit to their testimony in this.

Among those who have proved their faith by their works, in this matter, there is no one more conspicuous than E. Phinney, Esq., of Lexington, whose views in relation to it were given in a note appended to an address published in 1844, in the Transactions of the Society for that year. We have renewedly inquired of him, his views at the present time, and think we cannot, in any other manner, so well instruct the farmers of our county, as by appending his letter to this report.

The committee had the pleasure of witnessing, on the day of the exhibition at Lynn, a very successful experiment with the sub-soil plough, by Ira Worcester, of Ipswich. The plough was new, made by Ruggles & Co., of medium size, with a single flange. The soil was a dark rich mould on top, with a gravelly sub-soil, free of fixed stones. The sod was turned by the power of one pair of cattle, to the depth of *six inches:* the sub-soil

plough was drawn by three horses, and completely stirred and loosened *nine inches* deeper; so that it could be penetrated with a cane, as readily as could a chest of meal. Every one who saw it was astonished at the ease with which the plough was held, and the perfection of the work accomplished by it. This work left the same material on the surface of the ground, as was before the ploughing. For all those crops where the fibres of the plants have a tendency to descend more than six inches (and we scarcely know any that do not), such a preparation of the soil must unquestionably be serviceable. We can scarcely conceive of a case where it will be considered prejudicial.

The committee take pleasure in awarding the premium of *ten dollars* to Mr. Worcester, for his enterprise in exhibiting this experiment.

J. W. PROCTOR, *Chairman.*

Lowell, Sept. 24, 1847.

Dear Sir :—The opinions which I expressed to you some years ago on the effect of sub-soiling, I have had no reason to change. Every experiment I have made has invariably strengthened my convictions of the great utility of the sub-soil plough. It is now more than twenty years since the first introduction of this important implement in English husbandry, and I now recollect no instance of the expression of a doubt of the advantages to be derived from its use; so far from this, it is not uncommon at this time, in that country, for landlords to expend six or seven thousand dollars in sub-soiling a single farm; and tenants are not unwilling to pay an increased rent, equal to the interest on the outlay. In that country, not only soils too dry, but those too wet, are considered as benefited by this process. When there is a deficiency of moisture, it gives the roots of the plant the means of penetrating deeper in search of moisture : when there is a redundancy, it is believed to furnish a means of absorbing or drawing off the excess of moisture.

I readily grant that the effect produced by the use of the sub-

soil plough on soils of different textures, may vary. On a stiff clay, and particularly one that is very moist, the effect is less permanent. The tendency of the several parts in a soil of this character to reunite, is so strong, and the effect of sub-soiling of so short duration, I will allow it may be of doubtful expediency.

But in our *hard* New-England soils, with our *hot* New-England summers, so subject to severe droughts, at a season when our crops, particularly what are called our root crops, require the greatest supply of moisture, there cannot be, it would seem to me, a doubt, among farmers of a reflecting mind, as to the great benefits to their crops of the use of the sub-soil plough. It furnishes, in my opinion, an almost sure and certain means of counteracting the injurious effects of our sometimes severe droughts. The reasons would seem too obvious to need recital. The deep trench opened by the sub-soil plough, forms a receptacle for the surplus water that falls upon the surface at one season of the year, where it is retained to supply the deficiency at another. The "under crust" which is formed in long-cultivated fields, at the depth from the surface at which it has usually been ploughed, has in most soils become as impenetrable by roots of plants, as the highway which has been travelled over for a like number of years. The increase of crops in consequence of sub-soiling has never, with me, been less than twenty-five per cent. The supply of rains for the present season has been so abundant, that the difference in the yield upon lands sub-soiled and those not sub-soiled, could not be supposed to be so great on grounds naturally dry, as in some of the past dry seasons; and yet on a dry loamy soil, with a hard gravelly sub-soil, one part of which was sub-soiled and the other not, planted with the Chenango potato, I have recently gathered four bushels from each of the sub-soiled rows, while from the rows not sub-soiled, planted side by side, and cultured and manured, in other respects, precisely similar to the sub-soiled rows, I have taken but three bushels. There is a difference of twenty-five per cent. in quantity; and such was the improved quality and appearance of those on the sub-soiled part of the field, that they actually sold in the market for twenty-five per cent. more than the others.

I could adduce numerous instances, in this and other countries, to show the unquestionable result of sub-soiling; but I consider the question too well settled to admit of doubt. I should as soon think of producing evidence that the light of the sun was necessary to bring forward and mature the fruits of the earth.

With great respect, I am, dear sir,

Your obedient servant,

E. PHINNEY.

To J. W. Proctor, Esq.

On Turning in Green Crops for Manure.

This subject is one of interest, and deserves the mature consideration of the agricultural community. The plan of renovating lands by turning in green crops, though not new, has not, so far as I am advised, been extensively practised in Massachusetts. In Essex County a few experiments have been made, and these with various success. In some parts of our country, the results of experiments have been all that the best farmers could reasonably wish. Worn-out lands, favorable to the use of plaster, have, by a succession of clover, rye, or buck-wheat crops, been entirely renovated, at comparatively small expense. In other parts, while results have been encouraging, and in the main satisfactory, they have not equalled the glowing descriptions published by the entirely successful. These different experiences are to be attributed, probably, to the difference in soil, location, climate, &c.

I have conversed with many of the most intelligent farmers in New England on this subject, and they uniformly agree that green crops will prove valuable to clayey soils, by rendering them more friable, as well as retentive of moisture, and to light sandy soils, by imparting to them properties of which they are deficient. But they as uniformly doubt the utility of this process of enriching poor lands, if a dressing of manure is required to produce the green crop, or if, by the process, the lands must

lie idle until the succeeding season. They think that, unless a green crop can be produced without manure, the high cost of that article will render this system of renovation too expensive. From all I can learn, however, I incline to the opinion, that the green-crop system will be found useful for lands on which plaster can be successfully used in the place of manure. For other soils, it may not answer. More experiments will furnish a surer basis of decision.

As no statements of experiment were handed in at our late anniversary, I requested my colleagues, Dr. Nichols, of Danvers, and Henry Osgood, Esq., of Andover, to furnish me with their views on the subject. With this request, they have kindly complied.

EDWIN M. STONE, *Chairman.*

Danvers, Oct. 15, 1847.

Dear Sir:—On the subject of turning in green or *dry* crops to fertilize tillage lands, I have a few facts to state, and an opinion to express.

I once had as much corn fodder,—that is, as many corn-stalks as would grow without manure,—at least five or six tons to the acre, carefully cut and covered by the soil in the month of September; and the result was, no benefit to the land, the loss of the crop ploughed in, and half the crop of corn planted thereon the succeeding year!

Did the buried crop then really injure the soil? Perhaps not. I account for the last-named loss by the fear I had of losing much of the fertilizing quality of the rich mass which I supposed was rotting below, should I turn it up by the plough, and expose it to the sun and air by so doing,—and consequently planting the corn on manure in holes, without ploughing the land at all, presuming—mistaken man as I was—that the roots of the corn would find no difficulty in permeating a soil so rich and *spongy*, as I supposed that must be. But in reality the soil was neither rich nor spongy. The stalks, instead of rotting, had fermented and been converted chiefly into alcohol and vinegar—the former

flying off by evaporation, and the latter uniting with the alkaline or ferruginous earths—forming salts less fertilizing, perhaps, than their bases as they existed in the soil previous to their union with the acid. Whatever theory on this subject we may adopt, I presume it will be generally admitted that alcohol and vinegar are poor, very poor food for animals or vegetables. And consequently, such vegetables as produce these most abundantly,—those containing much sugar,—such as corn-stalks, especially when green, are not the best articles for the purpose under consideration. Buck-wheat and clover are probably better.

Hon. Daniel P. King, who a few years since obtained, I think, the society's premium for an experiment with buck-wheat turned in as manure, is decidedly of the opinion that it is not an economical method of renovating lands—this turning under green crops—unless it be thus to use the weeds which grow often so luxuriantly on stubbles, and the crop intended to be benefited be sown—winter rye for example—at the same time.

The opinion which I would express is, that it cannot be good economy, in the county of Essex, to endeavor to fertilize lands in this manner.

Some of the reasons for this opinion follow:

1st. One year's rent of the land is lost.

2d. The cost of seed and labor would procure and apply compost-manure enough to insure a better crop, the present season, and benefit the land for a longer term, than any crop raised on the ground without manure, and ploughed in, will insure the next season. Compost-manurers will get their reward one year sooner than the turning-in-green-crop farmers. Let us suppose a case: A. buys a farm, the soil naturally good, but run out by neglect and bad husbandry. There are plenty of such farms to be found. He goes to work on the green-crop fertilizing plan, and expends in seed, labor, &c., $500, and puts his whole crop under the soil. Income, 0. Account of farm Dr. to cash and int. $530.

B. buys at the same time a similar farm, lays out in compost and labor $500, and obtains a crop worth $530. In the spring following, his account will stand:

Farm Dr. to cash and int.	$530 00
Farm Cr. by crops,	530 00

Second year, A. lays out in labor, &c., $500, seed $530—$1030. In the spring following his account will stand:

Farm Dr. to cash, $1060 80
Farm Cr. by crops, 1360 80, to equal B.'s profits.

Second year, B. lays out in labor $500. His account, in the spring, will stand:

Farm Dr. to cash, $530 00
Farm Cr. by crops, 800 00: gain $300.

Will A. get so much more than B. the second year? I think not.

I think that B. will get the largest crop the second year. But in this I may be mistaken; but so long as good materials for compost can be easily obtained, I think we should do nothing to divert the attention of the farmers of Essex from the "powers of mud," as a regenerator of worn-out tillage lands. The fact, that there have been no claimants for the premiums offered for the best experiment of ploughing in green or dry crops—premiums, which would defray all the expenses of the experiment, and leave all the betterment of the land as clear gain—speaks loudly the opinion of practical farmers on this subject.

Yours, respectfully,

ANDREW NICHOLS.

To Rev. E. M. Stone.

Andover, October 11th, 1847.

Dear Sir:—With regard to ploughing in green or dry crops for manure, my experience is rather limited. I have a field containing five acres, lying about one mile from the house, (rather too far to carry manure, as high as wages have been,) the soil of which is naturally very good. One half of this field was sowed with winter rye, annually, the stubble was ploughed in after haying, and the land ploughed the next June, and often again before sowing. The crop of rye growing less, I sowed one half the field with buck-wheat; when it was fully in blos-

som ploughed it in, taking due care to cover it well; sowed with winter rye. The crop, I think, did not exceed eighteen bushels. My impression is, this exceeded, a very little, the crop produced on that part where I did not plough in a green crop. Believing the returns did not remunerate for the labor bestowed, I have discontinued the practice of raising rye in this way.

As far as I can learn, the practice of ploughing in green crops is not attended to by the farmers in my neighborhood.

With great esteem, I am, &c.,

HENRY OSGOOD.

To Rev. E. M. Stone.

Grain Crops.

There were two entries for premium on Indian Corn—one by John Woodbury, of Lynn. The quantity raised by him on little more than an acre, is 76½ bushels. The quantity to entitle the claimant to a premium, is limited by the trustees to not less than 80 bushels to the acre; therefore, the committee do not consider this entry as coming within the rule for a premium.

The other entry was by Moses Pettingill, of Topsfield. It appears, by the certificate accompanying the entry, that he raised 88 bushels on an acre. There does not appear to be any thing out of the ordinary mode of cultivation, save the keeping of the surface of the ground flat, and sowing grass-seed at the last hoeing. The corn crop was not probably affected in any way by sowing the grass-seed. Whether this mode of seeding down ground to grass is preferable to any other, the committee are not prepared to say. Leaving the surface flat is probably preferable to drawing up the earth high around the corn.

The roots of the corn running off from the stalk, will be better secured from drought, and will find more nourishment from the manure in the soil, if left flat, than if that manure and mould are piled up around the stalk. The roots, to cover themselves, are forced deep between the hills into the sub-soil, where no ma-

nure has been applied, and repeated experiments have shown that the corn stands equally well without hilling The stalk, when considerably grown, throws out from four to six or eight roots near the surface of the ground, whether the corn is hilled high or not. These brace-roots get far firmer hold on the flat surface than on the hill, for that is loose and constantly washing down.

The committee consider the corn crop of Mr. Pettingill an extraordinary one, considering the quantity of manure applied to the land, being, as per statement, only five cords. The year previous, the same quantity of manure was used for a like crop, and he judged seventy-five bushels were obtained. It is not stated what condition the land was in when broken up.

The committee recommend that the first premium of eight dollars be awarded to Moses Pettingill, of Topsfield.

MOSES NEWELL, *Chairman.*

Moses Pettingill's Statement.

I offer for premium a crop of Indian Corn, obtained from one acre of land, and measuring eighty-eight bushels. The land is a dark loam, with a sub-soil of yellow loam mixed with gravel. The corn which I planted, is the large eight-rowed yellow kind, the same which I exhibited at Lynn, for two years past. The ground was ploughed in September, 1845, cross-ploughed the first of May, 1846, with the Eagle plough, No. 25, ten inches in depth; two inches in depth was then broken up. The ground was planted with corn in 1846, with five cords of manure to the acre, and, in the opinion of good judges, it was estimated that there were seventy-five bushels of corn to the acre. The hills were split and harrowed in May, 1847, and four cords of manure from the barn-cellar were spread on the ground, and ploughed in seven inches in depth, and furrowed three feet one way, and four feet the other; one cord of fine hog manure was put in the hills. The ground was planted on the 18th and 19th

of May. It received two hoeings; at each time the cultivator was used; the land was kept level; at the last time of hoeing, grass-seed was sowed. The 17th and 18th of November, it was cut up and harvested.

Expenses of the crop.

The land I value at $90.	
Interest of the land,	$ 5 40
Five cords of manure, at $6,	30 00
Heaving manure,	1 00
Ploughing, harrowing and furrowing,	4 00
Putting out manure,	2 00
Dropping and covering the seed,	2 00
Cultivating and hoeing twice,	5 00
Topping the stalks,	1 00
Harvesting and husking,	4 00
	$ 54 40

Value of crop, &c.

Half the manure,	$ 15 00
Eighty-eight bushels of corn,	88 00
Three tons of fodder,	24 00
	127 00
From which, deduct expenses of crop,	54 40
	$ 72 60

ROOT CROPS.

Notwithstanding the great variety of dishes displayed in our bill of fare, the committee, on sitting down to their entertainment, found themselves restricted to but one, and this not of the most savory odor. They found onions of the very best quality,—but still nothing but onions. They also found this article now for the first time brought forward. At the solicitation of the committee, they have been favored by the several

claimants, all of Danvers, with minute statements of their methods of cultivating onions, and of their products the present year.

In addition to the information thus derived, and in compliance with the wish expressed at the time of their appointment, your committee have spared no pains, by personal examination of fields under culture, through the season, and by inquiry of those best informed on the subject, to become thoroughly acquainted with this branch of culture. And although they do not wish or expect every owner of land to become a cultivator of onions; and do not believe that all have the skill, industry and perseverance necessary to success, if they should attempt it; still they are not aware of any other use of land that affords a better reward for the labor applied, unless it may be the cultivation of some fruits and garden vegetables, in the immediate vicinity of large markets, such as *strawberries*, *asparagus*, *celery*, &c., for which the demand is limited, and which must necessarily be distributed and consumed at the time.

The general result of our inquiries is, that the average yield of onions in the town of Danvers the present year (where at least two hundred acres have been cultivated) is one hundred and eighty barrels, or from four to five hundred bushels per acre. The average value, for several successive years, has been *one dollar* per barrel. The present year, the best kinds have commanded in the market, *one dollar and a quarter* per barrel. The average cost of dressing and cultivating an acre of land with onions, does not exceed *seventy-five dollars*—leaving a *net income*, for the use of the land, of at least *one hundred dollars* per acre.

When the committee sat down to their repast, they were not a little annoyed with the apprehension, that it might be any thing but agreeable, inasmuch as nothing but onions were then presented. But they are happy in being relieved of these apprehensions, before it was too late, by there being brought in several dishes of carrots, well prepared, which, on examination, were found to be of the very best quality. Mr. Ware's crop, on nearly one acre, is at the rate of thirty-five and a quarter tons to the acre. Mr. Bushby's crop, on more than half an acre, is at the rate of thirty-two and one third tons to

the acre. There may have been larger crops than these; but the largest that has heretofore come to our knowledge in this county, was thirty-two tons to the acre, and this on extremely good land. Mr. Ware's land, situated on the borders of the ocean at Marblehead, we know to be good; and so are his advantages for dressing it, of which he makes a liberal use, applying at the rate of eight cords of manure to the acre. Mr. Bushby's land, situated in the south-westerly part of Danvers, on Needham's Plain, (so called) is of ordinary quality, but for ten years past has been under the care of most faithful cultivators. He applied manure at the rate of five cords to the acre. The committee are aware that the largest quantity of produce on the same quantity of land, all other things being equal, is of course the most meritorious claim. They are also at the same time aware that premiums should be awarded, not so much for the quantity of produce, as for the skill apparent in the production of it. In view of all these facts, they entertain a highly favorable opinion of both these claims, but are not prepared to say which is the most worthy; and therefore think it proper to divide the premium.

The committee recommend that the society's premium of six dollars be awarded to John Peaslee, for his successful culture of onions; and that a gratuity of three dollars each be given to Aaron C. Proctor, James P. King, Daniel Osborn, Benjamin P. Ware, and Henry Bushby, for their attention in preparing their statements.

J. W. PROCTOR, *Chairman.*

John Peaslee's Statement.

I have about three acres of land cultivated with onions. Lot No. 1, on Wilson's Hill, west of Liberty Street, containing one acre and three quarters. Lot No. 2, on the opposite side of the street, containing three quarters of an acre. Lot No. 3, situate in the field next adjoining easterly, containing half an acre.

Lot No. 1, has been cultivated with onions for fifteen years or more. When I first began upon it, it was rough and full of

large stones. It had been manured but little for many years. For five or six years, I applied to it about five cords of muscle-bed to the acre, costing about two dollars per cord. Since then, I have applied about five cords of manure, principally from the stables, to the acre, costing from four to five dollars a cord. In the spring I plough the land once, then harrow it and bush it, and rake it so as to make the surface finely pulverized, and free of all impediments to the sowing of the seed. I use a machine for distributing the seed. A man will sow two acres in a day, after the land is properly prepared. I use about three pounds of seed to the acre. I raise my own seed. It is estimated worth one dollar a pound. I am careful in selecting the best-formed onions for seed. Great improvement has been made in the quality within a few years, by care in the selection of onions for seed. I usually weed them twice with care. I now use a machine for the hoeing which moves on wheels, and diminishes the labor very much. A man with a machine will readily hoe an acre in a day. The next process is the pulling and throwing them into beds. When this is done, if the weather is fair, they will need to be turned once with a rake; and then, in about two weeks after they are pulled, they will be in a condition to be gathered. They are sorted by children. I have frequently known boys and girls of ten years of age, sort fifty bushels in a day. The usual allowance for this is one cent a basket. Lot No. 2, has been cultivated with the onion for about ten years. It is land of very good quality. The crops on this were extremely good. Lot No. 3, was never before cultivated with the onion. It is a hard, rocky, strong soil. The average quantity of manure on all the land was about five cords to the acre. The land on which these crops were raised, in its present condition, is worth about two hundred dollars per acre. Care has been taken, in years past, to prevent the weeds seeding upon the land; and hence the labor of cultivation has been much lessened. Myself, and a boy about fifteen years old, have done all the labor, excepting about twelve dollars worth hired by the day. I have other lands and crops to attend to; so that not so much as half our time has been applied to the onions. Our crop, the present season, amounts to *nineteen hundred and eighty bushels* of

onions, as fair as I have ever seen—with few small ones or skillions to be thrown out. They now sell readily at half a dollar a bushel, cash payment. Last winter, they advanced to nearly double the autumnal price.

I have given a statement of all my fields of onions, without any selection of pieces,—the same having been cultivated without any extra care, or intention of publication. We in Danvers think we have made great improvements in the cultivation of this crop within a few years, and have been willing to continue them among ourselves. But still, I do not hesitate to state the facts just as they are; and if any one is willing to follow this mode of cultivation, and work as hard as I have done, I cannot doubt he will find a fair reward for his labor.

Danvers, September 25th, 1847.

Aaron C. Proctor's Statement.

At the request of my brother, I present a statement of my cultivation of onions for five years past. I do this, not pretending to any superior knowledge, for I am a novice in the business, nor to any extraordinary crops; but to show by what steps I have advanced, and enable others to guard against my errors.

In 1843, I appropriated half an acre of flat land to this use—the soil a sandy loam of fair quality. The land had been planted with carrots and beets the preceding year. I put upon it two and a half cords of stable manure, and a leach of ashes. Ploughed in the manure—ploughing about five inches deep. Weeded twice thoroughly, and once after haying. Raised two hundred and fifty bushels. On the carrot ground, there was one quarter part more onions than on the beet ground; and they came forward earlier and fairer.

In 1844, I cultivated the same piece of ground, and applied about the same manure. Weeded twice, and used the onion hoe in clearing the weeds; found this to relieve the severity of the labor. Sold, from the lot, three hundred bushels at half a

dollar a bushel. One quarter part of the lot was planted with seed that I purchased, that came up badly, and yielded but little. At the second time weeding, I sowed grass-seed on the land, which took well, and has continued since to yield at least two tons to the acre.

In 1845, I took a piece of elevated ground, three quarters of an acre, rocky, hard land, strong, black soil, rather moist, and not forward; had been planted two years with corn, ordinary manuring, and yielded about forty bushels to the acre. I split the hills and ploughed, as early as the ground would admit of its being done; spread on seven cords of manure, and ploughed it in; then harrowed the land thoroughly; spread on two leaches of ashes: these not fully covering the land, I applied about thirty bushels of dry ashes; then passed over the land with a cultivator, harrowed, bushed, and raked it, sparing no pains to place it in a good condition. Sowed about three pounds of seed to the acre. Weeded as heretofore. About one eighth part of the lot was cut off by the *grub-worm*—a very vexatious visitor, and one that demands *close squeezing*. I gathered and sold two hundred and seventy bushels, at an average price of forty-five cents. In the autumn, I was particular to clear the land of all refuse material, believing this to be the most effectual way of avoiding the troublesome visitor of which I have spoken.

In 1846, about the first of May, I spread upon the land five cords of stable manure, ploughed it in, harrowed, bushed and raked it. Then sowed about four pounds of seed to the acre,—intending some spare plants for the use of the worms. Let out the care of the field and harvesting—allowing therefor one third of the crop. My proportion was one hundred barrels fair onions, which sold for one dollar a barrel; and thirty-three bushels of small ones.

In 1847, I put upon the land four cords of muscle-bed, costing two and a half dollars a cord, and three cords of manure, worth four dollars a cord; ploughed in the dressing about the first of May. Sowed seed at the rate of three pounds to the acre, which I purchased of D. Buxton—the round, plump onion. Weeded, the first time, about the sixteenth of June, and finished weeding, the second time, the fourth of July. After this, was busily en-

gaged in haying; and when I looked at my onions, found the field completely covered with parsley; so that I was fearful the crop was spoiled. We immediately applied ourselves to pulling out the weeds, and taking them away by cartloads. All parts of the field were essentially injured by this process, and a severe wind that soon followed: where the weeds were first cleared, the crop was best. I selected, gathered and measured ten rows together, which yielded four and one half bushels to the square rod—or at the rate of 720 bushels to the acre. Had it not been for the *weeds* and the *wind*, I know no reason why the entire lot would not have yielded in the same proportion. We have gathered and sold four hundred bushels, and have a few remaining. I have had eleven acres of other vegetables to take care of, fifty acres of grass to mow, and the milk of twelve cows to distribute. These facts I mention, as explaining the reason why my onions did not receive all proper care. Those who make it their special business to attend to this crop, can well have them in greater perfection.

I have spoken of using *old well-rotted manure*. I presume *green manure* from cattle, if it can be well mingled with the soil, will do quite as well, or better, as it has more strength. Where the onion land is sloping or liable to wash, care should be taken to guard against this by ploughing furrows about one rod apart.

I estimate the net income of my *best half-acre* of onions, the present year, to be not less than *seventy-five dollars;* and for the whole period I have raised them, to be not less than *fifty dollars a year.*

Danvers, October 30th, 1847.

James P. King's Statement.

My cultivation of onions, the present year, has been on a lot of land containing one acre and one third. In 1842 it was broken up and planted with corn. About four cords of compost manure were then applied. It yielded about fifty bushels to the acre. In

1843, I ploughed about nine inches deep, and put on eighteen cartloads of stable manure, and planted carrots, and raised twenty-one tons, which I sold, on an average, for eight dollars a ton. In 1844, I ploughed about six inches deep, and applied about five cords of manure, mostly from stable. I then obtained about four hundred bushels of onions to the acre.

In 1845, I ploughed shallow, and put on about one hundred bushels of leached ashes, and four cords of stable manure, and obtained about four hundred and twenty-five bushels to the acre.

In 1846, I put on two leaches of ashes, one hundred and eighty bushels, and three cords of manure; all costing twenty-five dollars; and obtained five hundred and sixty bushels of onions.

In 1847, I ploughed the land but once, applied two cords of muscle-bed, two leaches of ashes, and one and a half cords of manure; and obtained six hundred and fifty bushels. Until this year, I have sowed the flat onions; this year I sowed part flat and part round. The flat yielded at the rate of four hundred and twenty bushels to the acre. The round yielded at the rate of five hundred and thirty-three bushels to the acre. No difference in the land or treatment. I have used the machine for distributing the seed, and the onion hoe for clearing the weeds. They were weeded twice thoroughly, and hoed and weeded the third time. I have been careful to clean all the weeds and refuse material from the land in the autumn. My crop was severely injured by the wind in the early part of August. Until this wind came, they looked very large and promising. We thought the injury amounted to one hundred bushels to the acre. The ground is level, and a strong hard soil, rather rocky. My crop has sometimes been affected with what we call the *grub-worm*. It is a dark-colored worm, about one and a half inches long, that eats off the plant close to the ground. I have sometimes known them destroy the rows, several feet in extent. They operate in the night-time, and the only way to prevent it, is to hunt for them and destroy them. I have known fields entirely destroyed by this worm.

My mode of management has been much the same as that of

other cultivators. As a dressing for onions, I give the preference to *well-rotted stable manure.*

Danvers, October 20th, 1847.

Daniel Osborn's Statement.

I offer for a premium a crop of onions, raised from one acre and thirty-two rods of land, measuring eight hundred and seventy bushels. Land worth two hundred dollars per acre; dark soil, western descent. A crop of onions has been taken from the land, a number of years in succession, none of them, however, so large as the one the present year. The manure which has been used is well-rotted stable manure, worth four dollars and twenty-five cents per cord at the stable. The land has been ploughed to a depth just sufficient to bury the dressing. Between the first and middle of April of the present year, the land was manured, ploughed, and prepared as usual, and a few ounces less than three pounds of seed sowed to the acre. The usual method of hoeing with a machine, and weeding by hand, was pursued. The crop was harvested by the twentieth of September, and carefully measured in a bushel basket.

The statement of the expenditures is as follows:—

Six cords of manure at $4 25 per cord, .	$25 50
Spreading manure, preparing and sowing, .	6 00
Two and seven eighths lbs. of seed at $1 00 per lb.,	2 87
Hoeing, ...	6 00
Weeding, ...	12 00
Harvesting, ...	8 00
Making an aggregate amount of . .	$60 37

Danvers, October 29th, 1847.

Benjamin P. Ware's Statement.

I offer for your consideration a crop of carrots raised upon land of a gravelly loam, on which was raised a crop of potatoes for two years previous, from a dressing of compost made of barn and sea manure, at the rate of six cords per acre each year.

In preparing the land for carrots last spring, I first spread on a compost made from meadow-mud, dug in the August previous, and kelp (taken from the sea-shore during the winter) in equal proportions, the whole being thoroughly mixed and pulverized, before spreading, at the rate of eight cords per acre, which was well ploughed in, and allowed to remain ten days: then the land was cultivated with a large ox-cultivator, made upon a larger scale than those commonly used with a horse; after which it was harrowed, and then dragged with a common stone-drag drawn sideways, which in some instances, I think, answers a better purpose than a roller; the seed was sowed in drills, fourteen inches apart, at the rate of three quarters of a pound per acre.

The carrots were hoed and weeded twice during the season, thoroughly, and the third time slightly. As no weeds had gone to seed for two years previous, the process of weeding was much more easily accomplished. The crop was harvested by topping the carrots with a sharp shovel as they stood in the ground, and then ploughed out, which is a very expeditious method.

The weight of the crop was ascertained by digging, and throwing the carrots, in heaps of six several rows, in different parts of the piece without selection, and when dried, were weighed: the rows in the whole piece were counted and multiplied by the mean weight of one row, resulting as follows; upon $147\frac{21}{100}$ rods of land there were grown, 32 tons, 965 lbs. of carrots.

Marblehead, November 12th, 1847.

Henry Bushby's Statement.

The field that I have cultivated with carrots, the present year, contains ninety-five rods.

It has been under cultivation for vegetables for a dozen years past. It is a sandy loam, naturally rather a shallow soil. It has been manured with four to five cords to the acre. The last year, I raised on it sugar-beets and sage. I planted carrots this year to bring it into a condition for the raising of onions. I put about three cords of green manure from our barn-yard to the acre. Ploughed it in about six inches, bush-harrowed it, avoiding the use of the iron harrow, so as not to bring the manure to the surface. Sowed the seed about the 10th of May, by a drill-machine, in rows fourteen inches apart; the lot was sixteen rods long, and contained 78 rows. I sowed half a pound of seed of the short-horn carrot. Weeded them twice. Pulled the carrots, without any use of shovel or spade. I had six hundred and forty bushels, weighing sixty pounds to a bushel, making nineteen and one fifth tons, valued at $7 per ton, making the gross produce $138.

Danvers, November 13th, 1847.

Cranberries.

The experiment of Winthrop Low, of Essex, is one of great interest. It establishes the fact, so far as it can be done in one year, that cranberries may be raised in perfection upon a dry upland soil, without artificial watering. The soil selected by him was, most of it, a sandy loam. It was perfect Indian-corn land. The soil is porous, and would not retain water, even if the ground were level. But it must be remembered, that in no part of the field can the water stand so as to keep the roots *saturated* any considerable time together. A small rill of water, indeed, passes through the field, but confined to a width not exceeding five feet, and usually not more than one foot.

The running water is within about twenty-eight feet of one side of the field, and from the row of cranberries next to the ditch back to the side of the field, the ground rises, on an average of the whole distance, twenty-eight inches, being an inch to a foot

Here, then, clearly, water would run off freely. On the other side of the ditch, the ground rises six feet and five inches in a distance of one hundred and thirty-two feet, which goes to show that the vines do live and grow without water, at least with no more than is needed for a crop of corn or beans.

The altitudes were carefully taken by the undersigned, with a spirit-level attached to an engineer's compass, having the telescope and every fixture for accurate levelling.

As evidence of the completely upland nature of the soil, it may be stated, that a row of white beans was planted between every two of cranberry vines; and although it has not been a good year for white beans, Mr. Low has harvested nine bushels from the one hundred and twenty rods—a fact showing, also, that the land is not lost to the cultivator even the first year, indeed that the bean crop has defrayed a large part of the expense.

The cranberry vines had put out runners in many cases, from three to four feet long, and have all the marks and numbers of health and vigor. Sand was applied to about one half of the hills, but without any apparent advantage whatever. The attention of the committee was called particularly to this fact, because the experiments in Barnstable County seem to have been all made with sand, and it is there thought and declared to be indispensable.

There was no artificial watering. The cranberry sods were taken up, as appears by the statement below, on the 15th of May, and set out on the 16th, 18th and 19th. The undersigned is informed by Asa Lamson, of Salem, that there was in that month (May) but two and seven eighths inches of rain. It could not have been the presence of water, then, that caused every root without a single failure to live, and nearly every one to produce berries.

It should be borne in mind, however, by way of caution, that there has been more wet weather during the last six months, than the average of the previous four years, or indeed any one of them. The whole quantity during the months of May, June, July, August, September and October last, is 25 3-4 inches; while during the same months in 1846, there was but 15 7-8

inches; though in 1845 the quantity was as great as this year, wanting 2 1-2 inches.

It should be recollected, too, that this is the first year, and what the effect of the winter will be without the *indispensable presence of water*, as the Yarmouth Register would say, remains to be seen. At present, the vines flourish like a green bay tree, and this, perhaps, is enough for the committee to say. The fact, that the roots could be taken dripping from their native meadow-bed, on the 15th day of May, put into a corn-field soil, and then, with nothing but the rain of heaven upon them, in five short months to take root downward, and bear fruit upward, is most extraordinary. A specimen of the fruit is with the committee, and it appears to be as good as the uncultivated fruit of the meadows. The quantity, as will be seen by the statement below, is one bushel and thirteen quarts. The land was carefully measured, by the undersigned, and found to contain 120 rods. It ought to be added here, that the field exhibits a case of clean culture; weeds and grass have both yielded to the hoe.

There is but one claimant for the society's premium, offered for the best-conducted experiment in the culture of the cranberry.

The committee think that Mr. Low is fairly entitled to the society's first premium of *fifteen dollars.*

DAVID CHOATE, *Chairman.*

Winthrop Low's Statement.

I offer for premium three quarters of an acre of land, set with cranberry vines. The soil is of a sandy loam. In November, 1846, it was ploughed. One half of the whole quantity was turf-ground, the other half had been planted with corn in drills for two years. May 17, 1847, I furrowed the ground with a horse-plough in drills, five feet apart one way, two furrows to each drill. On the turf part of the ground, I found it necessary to cut through the turf, in order to get a suitable depth for the

cranberry sod. In the drills were set 1267 sods, containing the cranberry vines; the average surface of the sod is nine by eleven inches, average thickness four inches; the sods were set four and a half feet apart in the drills, let into the ground with a spade, level with the surface, carefully levelling the whole surface of the ground round the sod with a hoe. I state, for the information of others, the labor of setting on the turf part of the ground was more than double to setting on that part which had been cultivated. I would therefore recommend to plough and cultivate the ground one year before setting.

The whole expense was as follows:—

Ploughing, ...	$2 00
Cutting and hauling sods from the cranberry meadow,	6 00
Setting cranberry vines, ...	5 00
Cultivating and hoeing, ...	4 00
	$17 00

In regard to the growth of the vines, they all appear to be alive, and the runners have extended from one inch to three feet in every direction. Oct. 14th, gathered from the vines one bushel and thirteen quarts.

Between the cranberry rows I planted the white bush-bean, and raised nine bushels.

Essex, November 10th, 1847.

Forest Trees.

By the Revised Statutes, Chap. 42, sec. 6, it is provided, that "every Agricultural Society which shall receive the bounty of the state, shall offer, annually, such premiums and encouragements, for the raising and preserving of oaks and other forest trees, as to them shall seem proper, and best adapted to perpetuate, within the state, an adequate supply of ship-timber."

Prompted by this statute provision, as well as by the generous donation of Richard S. Fay, Esq., on the same subject, herewith

published, we wish renewedly to call the attention of the farmers of the county to this interesting subject. In some of the early numbers of the society's publications, will be found useful instruction on this subject, from the pen of Mr. Pickering, who was always full to overflowing with all kinds of useful instruction. But as these numbers may not be readily at command, we have solicited, from several gentlemen best able to instruct, such remarks as seemed to them most appropriate; and have been favored with full and interesting replies.

Linmere (*Lynn,*) *September 25th*, 1847.

Dear Sir :—I regret that my engagements elsewhere prevent my attending the Agricultural Fair, on the 29th, at Lynn. I wish through you to propose a prize, to be offered by the association under their rules, of one hundred dollars, the money to be furnished by me, for the best plantation of oaks of not less than one acre; the prevailing species to consist of the white and the black or yellow oak, to be grown from the acorn planted this autumn, or in the spring, on land not now under tillage or in mowing. The prize to be awarded in 1852, and the money in the mean time to be placed at interest, for the benefit of the successful competitor. Notice to be given by each person intending to compete for the prize, stating the locality of the land, that it may be viewed and registered.

I name a small sum, and a small piece of land, in order to bring it within reach of every farmer's son whose father has—and what farmer has not? an acre of idle and unprofitable land. It will require no great expenditure of time, and no money, to enable any person to plant out an acre, and the advantage to the person so doing would far exceed the labor bestowed, even if an unsuccessful competitor. Should there be ten or more entries for this year, I pledge myself to renew the prize for the next ten years, upon the same terms.

With much regard,

Very truly Yours,

RICHARD S. FAY.

P. S. I had intended to furnish some rules to be observed in making oak plantations, but they are so conflicting, as laid down by different planters, that I have concluded it will be best for every one to follow out their own ideas upon the subject, referring them, however, to Emerson on Trees, Shrubs, &c., for some rules extracted from Loudon's great work. I cannot help cautioning against planting the acorn too deep: an inch in depth is enough for any of our native acorns.

R. S. F.

To B. T. Reed, Esq.

Boston, Nov. 6th, 1847.

Dear Sir:—It gives me great pleasure to learn, from your favor of the third, that an interest has begun to be felt in the cultivation of the best of our forest trees. Mr. Fay is taking the right course to foster and stimulate a taste for cultivation. Many persons would be glad to attempt cultivation, if they could afford the expense; and the prospect of gaining the premium, will be sufficient to induce them to make the attempt. He has also, I think wisely, proposed the premiums in terms so general, as to leave the shaping the particular conditions to practical agriculturists.

I am sorry that my want of experience in agriculture will prevent me from giving any suggestions of practical value.

There are two distinct objects to be regarded in the cultivation of forest trees,—their pecuniary value as fuel and timber, and their use as ornaments, screens and shades. The cultivation, in the two cases, must be quite different; yet I suppose the first steps must in all cases be the same. In our hard and barren soil, the land on which the seed was sown, or the young trees planted, must, for many years, be cultivated while the plants are growing, in order that they may make any show at all, even in twenty years. They will doubtless grow without cultivation, but very slowly. If an open pasture or newly cleared land should be taken, the process must be very different in the two

cases. In an old, open, uncultivated pasture, the soil and sub-soil are usually very hard, presenting great obstacles to the penetration of the roots. In this case, the ground must be ploughed, and sub-soil ploughed, that it may be opened and loosened, to the depth of two feet. After the acorns are sowed, or the trees planted, the plough can go only between the rows, leaving the sub-soil beneath the rows unmoved. This shows the necessity of getting the ground in proper condition, before the operation of sowing or planting begins.

The best kinds of oak are those of the white-oak group; viz: the common white oak, the swamp white oak, both of them common in Essex County, the over-cup oak and the mossy-cup, the latter to be found in Berkshire; the stem-fruited, and the vessile-fruited, which grow readily in our climate, and the chesnut oak, found north and south of us, and the Rocky Mountain oak, found in rocky hills, in several parts of the state. The wood of all these eight is of great value, as fuel and for timber uses. The next group is the red-oak group, containing the black or yellow-barked oak, the scarlet oak, the pin oak, and the two varieties of the red, called the red and the gray. The black and the scarlet are common in Essex County, and are valuable and very beautiful. The pin oak is found farther south, but would, I think, grow readily here. The red oak is a rapid grower, and a beautiful tree, but the least valuable of the oaks for fuel or timber. There is one species of the live-oak group, I mean the willow oak, which grows so luxuriantly in the states but little south of this, that I have no doubt that it would grow here.

The time for sowing the acorns is in the autumn, immediately after they have fallen from the tree. It is very difficult to keep the acorns through the winter, and it is necessary only when they are to be transported to a distance. They should be placed just below the surface. The plants must for some years be kept free from weeds. I suppose the most profitable way of doing this, is that practised in the peach-orchards in New Jersey, which are for some years covered with crops of beans, potatoes, or something else suitable to the soil.

The first acre, sowed or planted as a nursery, will bear plants enough for many acres of forest. As they grow larger, they may

be thinned out and transplanted; and when too large for that, may be gradually thinned for poles or for fuel. I suppose that, either for ornament or for timber forest, it would be a great advantage to continue to cultivate between the trees, until they cast so deep a shade, that nothing would profitably grow.

If recently cleared forest land is to be restored to forest, ploughing may be necessary, but probably not sub-soil ploughing, as the roots will have kept the ground open and porous by their own penetration. The thing to be principally regarded, is the character of the previous growth. Land ought not to be chosen, which has already been covered with oaks, unless the cultivator is willing to go to the expense of trenching to the depth of two or three feet, to bring to the surface unused, virgin soil.

It would be well to cultivate all the different species, as different species are adapted to different situations; the swamp oak and mossy cup to moist land, the rock chesnut to dry, rocky hills, the red to sandy, the white to clayey, the black and the scarlet to hard and hungry soils.

Perhaps it would be well to interpret "oaks" as including the oak family, and thus taking in the beech and chesnut; the former for its beauty as a tree near dwelling-houses,—the latter for its great rapidity of growth, and for its value as fencing and building stuff.

As the terms of the trust to the Agricultural Society are so general, perhaps it would be well to give an opportunity to those who wished to save time by forming plantations of trees already pretty well grown. This seems to be desirable; as the growth of all forest trees, for the first few years, is excessively slow, and as, with the same expenditure, many times as many trees may be raised in the nursery, as will be left to cover the ground in a productive forest or for ornament.

It would seem very desirable to make experiments upon creating forests in situations not susceptible of cultivation, as on the hills in Lynn, and in some other parts of Essex County. With this purpose, the acorns may be deposited amongst the bushes, or amongst the stones, slightly covered, and in quantities sufficient to allow for the depredations of squirrels and mice. The principal item of expense in this case, would be the fencing

of the lot until the young trees should have risen out of the reach of cattle and sheep. I have no doubt that many acres now worth very little for pasture, and nothing for any other purpose, might, in a few years, be restored to forest, to the great increase of the value of the land, and to the shelter and ornament of the surrounding country. The oaks best suited to this object, are those of the chesnut-oak division, particularly the rock-chesnut oak, the white oak, and the black and scarlet: the beech and the chesnut would grow in this way, and, still better, the birches. Pine and larches might be introduced on the same ground, which would have the effect of protecting the oaks while young; and, if the oak-forest promise well, might, as it came on, be cut down.

I know not that you will find these desultory suggestions of any value. If they should be thought so, it will give me pleasure to have contributed, however humbly, to so excellent an object.

Respectfully yours,

GEORGE B. EMERSON.

To J. W. Proctor, Esq.

Pembroke, Dec. 2d, 1847.

Dear Sir:—On the subject of your inquiry, it is not in my power to give so full information as may be desired. My experience in the propagation of forest trees, has been confined chiefly to the pine and birch families, which are best adapted to our soils. The oaks have been planted to a much more limited extent. Acorns should be gathered about the middle of October, and planted immediately; a few days drying will often prevent them from ever vegetating. In planting, there should be a very light covering with earth. It is believed to be best, to plant on land recently ploughed, and some cultivation among the young trees will greatly promote the growth of them. A man in Bristol County, about fifty years ago, planted a field somewhat ex-

hausted, with acorns; when the young trees were two or three inches high, he ploughed and hoed as in a field of Indian corn; the trees grew to the astonishment of the whole neighborhood, and, in less than forty years, were ripe for the axe. About a century since, there was an experiment in this town, in planting the white oak for ship-timber, the success of which ought to have encouraged frequent repetition. The grove was in cutting for timber thirty years since, and a man between seventy and eighty years old told me that, in his boyhood, he assisted in planting those trees. It is not, to the existing generation, so hopeless an undertaking as some would represent it, to plant forest trees—even those of slow growth. I recollect measuring the circumference of an oak tree in West Newbury, the acorn of which was planted by Benjamin Poore, who is yet comparatively a young man, and think it measured twenty-seven inches; it was a well-proportioned handsome tree. Had he planted, at the same time, fifteen acres of similar soil, it would have become, before now, an inexhaustible wood-lot for the use of one family. The gentleman who has made the donation to your society, possibly may be regarded by some as an air-castle builder; but if the association are faithful in carrying out his views, of which there is no doubt, it will, in less than thirty years, appear that he has been the efficient instrument in raising into the air multitudes of beautiful and useful trees, and thus meeting what will ere long become a pressing want in the community.

Respectfully,

Your Obt. Servant,

MORRILL ALLEN.

To John W. Proctor, Esq.

Essay on the Cultivation of the Onion.

BY JOHN W. PROCTOR.

The culture of onions has increased so much, within a few years, in this vicinity, that it has become one of the staple prod-

ucts of the county. In the town of Danvers, more money is realized from the sale of the onion, than any other product of the soil. Products of so much value, and commanding so much attention, are fit subjects of inquiry; and if there be any facts relating to their cultivation not generally known, it may be useful to have them brought forward.

In making these inquiries, our attention has been directed almost entirely to practical cultivators, without reference to scientific treatises—our intention being to tell their story, as near as possible, in their own way.

We shall treat of the subject in the following order:

1. The preparation of the land.
2. The manure best adapted to promote the growth.
3. The raising and planting of the seed.
4. The care necessary to be applied while growing.
5. The blights and injuries to which the crop may be liable.
6. The time and manner of harvesting.

1. As to the preparation of the land.

Differing from most other crops, the onion grows well, on the same land, for an indefinite number of years. Instances of continued appropriation of the same pieces of land to the growing of onions, for *ten*, *fifteen*, *twenty*, and even *thirty years*, have come to our knowledge. It is the opinion of many that the crop is better, after the land has been thus used a few years, than at first. Whether this arises from any influence of the crop upon the soil, or is the effect of continued dressing of manures, we have no means of determining. This is certain, that the qualities of the soil necessary for the production of good crops, are not exhausted by continued cultivation.

Rarely, if ever, have we known the onion sowed upon the turf when first turned over. It is usual to subdue and pulverize the soil, by the cultivation of corn, or some other crop—not unfrequently the first year with corn, the second with carrots, and afterwards with onions. It is important, before the seed is sowed, that the surface be mellow, finely pulverized, and clear of stones, or other impediments to the free and unobstructed use of the machine for this purpose. The finer and more uniformly

mellow the surface is made, the better. Shallow ploughing, say from four to six inches deep, is usually practised. Once ploughing only in the spring, and frequent harrowings, are practised. Before the ploughing, the dressing is usually spread upon the surface of the field, so as to be covered, or intermixed in the furrow. The mingling and subdivision of it, is effected by the use of the harrow.

Whether it would not be advantageous, occasionally, to stir the land to the full depth of the soil, is a point on which there is a difference of opinion; most of the cultivators inclining to the use of shallow ploughing only. There are some facts tending to show, that occasional deep stirring of the soil does no harm to the onion crop, but on the contrary is decidedly beneficial; as for instance, onions do better where carrots have grown the year preceding, than after any other crop. The carrot necessarily starts the soil to the depth of ten or twelve inches. Possibly there may be some other influence upon the soil from the plant itself. Our belief is, that the thorough and deep stirring of it, is the principal preparatory benefit.

2. The manure best adapted to promote the growth.

Any strong manure, well rotted and finely subdivided, will answer. But the general impression seems to be, that manure from stables, where the horses are freely fed with grain, is the best; and that it should be at least one year old, because it will not be sufficiently rotten in a less time. All agree that the dressing for the land should be kept near the surface, well mixed, and as fine as possible, though we have seen, the present year, a very superior growth of onions, where green manure from the barn-yard was applied in the spring; but particular pains were taken to subdivide and intermingle it with the soil; and to bush-harrow the land so thoroughly, that very little of the manure was exposed upon the surface.

Muscle-bed is frequently used upon onion land. A portion of this is deemed by some almost indispensable; we have known the continued use, for half a dozen years in succession, even without other manures, with a continuation of fair crops; but the general impression is, that it will not do to repeat the application of muscle-bed many years in succession, the effect being to harden the land, and make too much of a crust about

the surface. Without question, the effect of the muscle-bed is congenial to the growth of the onion, giving those who live in the vicinity of rivers where it is found, a special advantage over those who are remote from it.

Leached ashes is also a valuable manure in the cultivation of the onion; more so when *leached* than before. All kinds of ashes are advantageously applied on onion land.

Compost manure made of meadow-mud and droppings from the cattle, we have known advantageously applied on onion fields; but we have many doubts as to this being the best application of this kind of manure. A more lively and quickly operating manure is better for onions; one that will give them an early start, and advance them as fast as possible, in the first part of the season. The utmost vigilance and activity is used by our cultivators in getting their land ready, at an early period of the season, for the reception of the seed. It is the first field-labor of the spring. The use of compost-manure will depend much upon the constituents of the soil with which it is mixed. If the soil be a sandy loam, with a porous sub-soil, the compost will do tolerably well; but if it be a black soil, with a clayey sub-soil, such as are most of the lands where onions are raised in this vicinity, stable manure, or muscle-bed, or leached ashes, or a mixture of these, will be a better application. The quantity ordinarily applied annually, is from four to five cords to the acre. Whatever is applied, should be generously applied. It will be vain to expect full crops of onions, without full manuring. When the manure is collected, it is benefited much by a free application of *elbow-grease* in its preparation. The cultivator of the onion must work early and late, and in good earnest. Nothing short of forcible and persevering labor will answer. No man who is afraid of *soiling his hands or the knees of his trowsers*, will do to engage in this business. Close work at the proper time, is the only sure guarantee of a good crop.

3. The raising and planting of the seed.

In relation to the onion, as well as all other vegetables, much care is necessary in the selection of the plants for seed, and the cultivation of the seed. By the application of this care, the character of the article raised may be modified, almost at pleas-

ure. Until within a very few years, the *flat onion*, hollow about the stem, has been preferred. The thinner, the handsomer. But it is now understood, that the *round, thick, plump onion* is preferable in many respects. It is thought to yield better, and weigh heavier. It is found to have a decided preference in the market, commanding *ten per cent.* more in price. By selecting those of most desirable form, which ripen the earliest, and carefully setting them for seed, where they will not be exposed to the impregnation of the baser sorts, the quality has been materially changed and improved. These peculiarities in the onion were first noticed in this vicinity, by Daniel Buxton. He was careful to select in the field, before the crop was gathered, such onions as he preferred, and to preserve them for seed.

By so doing, the seed which he raised soon acquired a character superior to any other. Many of those who had been accustomed to raise their own seed in the ordinary way, laid it aside, and purchased seed raised by Mr. Buxton, and found their account in so doing. There are three varieties of the onion raised in this vicinity; the *silver-skin*, the *red*, and the *white onion*. The *silver-skin* is the predominant species, and more cultivated than all others. The *red* is preferred by some,—sells better in some foreign markets, but does not yield so abundantly. The *white onion* yields as well as either of the others, is milder, and preferable for immediate use. It will not keep as well, and is not fit for exportation; which is the principal use made of our onions.

The common drill machine is used for the distribution of the seed. This admits of regulation, so as to scatter it more or less thick; and in this there is room for the application of sound judgment. The usual quantity sowed is about three pounds to an acre. As a general rule, we should say, one pound of good seed was the proper quantity for a quarter of an acre of land of good quality, well prepared. It is desirable to have the seed planted as thick as they will grow fairly, both to secure a full crop, and prevent the onion growing too large—onions from one to two inches in diameter being preferred to those of a larger size. The skilful cultivator carefully looks after all these little incidents relating to his crop.

4. The care necessary to be applied while growing.

Much of the success of the crop depends on this care. At first, the plant is extremely tender, and requires to be handled with much caution. Any derangement of the fibres or roots of the young plant, is attended with prejudicial consequences. Much attention is necessary to prevent weeds gaining the ascendency; and in eradicating the weeds. Want of due care in this is often the cause of failure of the crop. We have known, the present season, a highly promising crop to be injured *twenty per cent.* at least, by permitting the weeds to remain unnoticed *one week too long.* This is especially true when there has been a want of due care in preventing the scattering of the seeds of the weeds on the land in the years preceding. Care should be taken, both that no weeds shall ripen their seed upon the land, and that no weed-seed shall be found in the manure. In this respect, warm stable manure, muscle-bed and ashes have a decided superiority over all other manures. Perhaps there is no plant more liable to be injured by weeds than the onion. The fibres it sends out are very numerous, minute, and tender; any fracture of any of these necessarily impairs the perfection of the plant. When the land is in proper condition, two careful weedings are all that may be necessary. The rest of the stirring of the ground that may be required to promote the growth, can be done with the *onion hoe;* an instrument, specially constructed for the purpose, moving on wheels, and adapted to the width of the rows. This hoe was invented by Joseph Bushby, of Danvers, an intelligent and successful cultivator of garden vegetables, about twenty-five years since; and was used by himself and neighbors only for about ten years. It has now come into general use, and saves much of *back-aching labor.* The usual distance between the rows is *fourteen inches.* This can be varied according to the quality and condition of the soil. Keeping the ground well stirred, loose and free of weeds, greatly facilitates the bottoming of the onion. There is no plant that will better reward diligent care in the cultivation. The entire difference between a bountiful crop, and no crop at all, often depends on this. The old maxim, "a stitch in time saves nine," applies with great force in raising onions.

5. The blights and injuries to which the crop may be subject.

So far as we have observed, this crop is as certain as any other that is cultivated. We know that onions will not grow without a reasonable proportion of heat and moisture; but we have rarely, if ever, known an entire failure of the crop, where due diligence has been used. There are occasionally blights, the causes of which we have not learned. The more prominent will be noticed.

Sometimes we have seen the plant covered with a small insect or *louse*, that gives the top a white or light-colored aspect, and stops and stints the growth. These make their appearance about the time the bottoming commences. We have heard their appearance charged to the use of muscle-bed,—but whether they are limited to land on which muscle-bed has been used, we cannot say. We think not. We think they are natural associates of the plant. The effect of them is to diminish the *quantity*, but not to materially injure the *quality* of the vegetable.

The crop is sometimes injured by a *blue mould* that gathers on the tops, occasioned by fogs, or an excess of moisture from frequent and long-continued rains.

There is a *worm* or *maggot*, occasionally found upon the onion plant, in the early stages of its growth, causing it to turn *yellow* and die. This insect will be found in the bulb, originating from eggs laid upon the leaves, by a small ash-colored fly, the scientific name of which is said to be *Anthomyia ceparum*. (See Transactions of the N. Y. State Agr. Soc. for 1843, page 135.) It comes to maturity in less than a month; so that there may be several generations in the course of the season. Their appearance in this vicinity is rare. Pulverized charcoal and fire have been found the most effectual remedies against the ravages of this class of depredators.

The most annoying enemy of the onion, is the *cut-worm*, or *grub-worm*. It probably is the same described by Dr. Harris, in his Report on the Insects of Massachusetts injurious to Vegetation, page 324, there called "*Agrotis devastator*;" and in the 1st vol. of Silliman's Journal of Science, "*Phalæna noctua devastator*," though Dr. Harris does not mention the *onion* as

among the plants upon which it feeds; probably considering it, like *tobacco*, as *too noisome* to be used by any decently-civilized being. They are said "to seek their food in the night, or in cloudy weather, and retire before sunrise into the ground, or beneath stones or any substance which can shelter them from the rays of the sun; here they remain coiled up during the day, except while devouring their food, which they drag into their places of concealment." The remedy for these worms, suggested by our cultivators, corresponds nearly with that proposed by Mr. Foote, of Berkshire,—"*to catch them and pull their teeth out.*" This being effectually done to all, their operations will be of a limited character. When this is omitted, we have sometimes known whole fields almost entirely cut down by these rapacious devourers. They sweep clean where they go, not suffering even the weeds or any other herbage to flourish. They are more frequently found on *old* ground than on *new;* and particularly where the ground has been covered during the winter with *chickweed or other vegetable substance*, on which the eggs from which they originate may have been deposited. Hence a benefit of clearing the ground of all vegetable matter or other obstructions, in the autumn after the crop is gathered. This clearing also facilitates the early planting in the spring. Autumnal ploughing, as it exposes the soil more fully to the action of the frost, and disarranges all abodes for the winter made by insects, may have a tendency to diminish their number.

6. The time and manner of harvesting.

When the tops begin to wither and fall, then it is usual to start the onions from their bed and throw together in rows, say eight or ten growing rows into one. After they have lain thus about one week, they are stirred and turned with a rake, and in about one week more, when the ground is dry, and the weather fair, they are gathered up by cart-loads and taken to the barn. Here they are sorted and cleared of refuse leaves, and then they are in a condition to be *bunched* or *barreled.*

It should be remarked, that a large part of the labor of *weeding*, *gathering* and *sorting* the onion, can be performed by children from *ten* to *sixteen* years of age. Boys of this age, when

properly instructed, will do about as much as men. They are more nimble, and can come at the work with greater facility. The sorting of the onion is frequently done by girls as well as by boys. From *three* to *five* dollars a week, at one cent a basket, are usually earned by them during the period of harvesting—which includes the months of September and October. After the crop is taken off, if the surface is sloping, it is useful to plough furrows about one rod apart, to keep the surface from washing. Unless this is done, all the herbage being gone, much of the soil will be likely to be misplaced, by the melting of snows and running of water in the spring.

The inquiry arises, whether the growth of the onion is limited to soils of particular character, or whether it can be cultivated upon any good soil, with proper attention. We know that there is a popular impression, that there are but few places in which the onion can be cultivated advantageously. So far as our own observation has extended, this impression is in a great measure erroneous. Like every other plant, the onion grows best on very good soils, in very good condition. But we have known very fair crops on plain, light land, after the same was well saturated with *manure, muscle-bed* or *ashes.* A good substratum must be laid before a good crop can be expected; and this being done, a crop may be expected on almost any soil that will support other vegetables.

If we were asked, what course is best to be pursued with land on which onions have never been raised, to bring it into a condition for a successful cultivation of the crop; we should say, begin by ploughing to the full depth of the nutritive soil, and during the first and second years, thoroughly subdue and mellow the soil by the cultivation of crops of corn and carrots, with liberal dressings of manure; then thoroughly incorporate with the soil a dressing of strong manure, and muscle-bed just covering this dressing; then harrow the surface thoroughly, and clear it of all roots, weeds, or other obstructions; then apply a coating of lively, well-rotted manure to the surface, and bush-harrow it; and then it will be in a condition to receive the seed, which is to be inserted as soon as the opening of the spring will admit of its being done.

We are aware that we make the raising of the onion, dependent upon severe labor and vigilant attention. We know that it cannot be successfully done without these. But it is not labor lost. No cultivation, within our observation, better repays for the labor and incidental expenses. We have known, the present season, acres that have yielded their owners a net income of more than *two hundred dollars;* and we know that a man, with two boys, can well attend to half a dozen acres of such cultivation. Surely, when, as at present, there is no limit to the demand for the article, and a ready cash market, those who have *acres*, and are willing to labor, need not be in want of a fair compensation for their labor.

As samples of the present year's produce in the town of Danvers, we state the following that have come under our notice.

Names.	Acres.	Produce.
John Peaselee,	3	1980 bushels.
Daniel Osborn & Son,	1⅕	870 "
James P. King,	1⅓	660 "
Aaron C. Proctor,	1¼	600 "
E. & D. Buxton,	6½	2750 "
Henry Bushby,	4	2000 "
Joseph Bushby,	3	1500 "

Yielding an average of more than 500 bushels to the acre.

Essay on the Cultivation of the Cranberry.

BY DAVID CHOATE.

Although cranberries have grown upon the wild vines in Barnstable County so long, that, in the language of the law, the memory of man runneth not to the contrary, the *cultivation* of this delicious fruit opens a *new field* of enterprise to the agriculturist. The names, it is true, of a few individuals in Dennis and Yarmouth, who are said to have paid attention to the subject some twenty years ago, are given in the agricultural papers; but probably the number was small indeed. The early volumes of the New England Farmer, even when conducted by the far-

reaching Fessenden, appear to be silent upon the subject. The word "cranberry," whether relating to the cultivated or wild kind, does not occur in Varlo's Husbandry, published in 1785, nor in Deane's New England Farmer, in 1795; neither is it to be found in Nicholson's Farmer's Assistant, a valuable work, published as late as 1820. Other acids were substituted for the table, and cranberries have not unfrequently been a drug in the market, at a dollar or even fifty cents a bushel. Indeed, of so little consequence is the culture of this fruit considered ever since, that town assessors, in reporting full statements of fruits and other esculent vegetables, agreeably to an order of the legislature, though they can sometimes find room for even the diminutive and short lived "whortleberry," and are known actually to have returned "ten pounds of hops," as indication of the industry of the town, find no room for cranberries; and it does not appear, from the returns, that more than 125 bushels have been raised in the entire Commonwealth. And this withholding of information on the part of those who are able to furnish it, presents not a greater obstacle in furnishing out a chapter on the subject, than the singular *conflict* of opinions among those who do speak and write. Let any one sit down to the purpose of preparing himself to cultivate cranberries, especially upon high land, shaping his plans according to the newspaper articles upon the subject, as they have appeared for a few years past, and he will probably find the whole subject appearing much as Dr. Johnson found the English language, when he took his first survey of it, "copious without order, and energetic without rules." Choice is to be made out of "boundless variety," and errors are to be detected without any settled test. If any action of our County Society shall prove effectual in eliciting information, positive, definite, reliable information in relation to it, it will render an essential service.

That it would be for the interest of our farmers, who have low or meadow land, capable of being flowed occasionally with water, to cultivate cranberries, cannot admit of a doubt; because in such situations, even under an administration of "slovenly neglect," they often yield in abundance. It may be, indeed, that the demand at present is not urgent. It may be that they

are sometimes hawked about the country, at one dollar a bushel. And what if it sometimes is so? An *increase of the supply will increase the demand*, even at an augmentation of the price. Hitherto, apples have filled a large share of the department which rightfully belongs to the cranberry, because, in the country, every family has, or may easily have, an orchard, or at least a tree; while few, even now, for a moment entertain the idea, that the delicious fruit of which we are speaking, can be raised upon any land fit for an orchard, in far less time than an apple tree possibly can, with the great advantage of being subject to no borer, canker-worm or caterpillar. For these reasons it is, that cranberries are not usually found upon the list of family articles which *must be had;* and accordingly they may have often been offered, without finding sale.

Is the cranberry capable of being transferred from low, wet land, to that which is high and dry?

And would it be a profitable crop upon high land?

These are questions which it is proposed to consider at some length. And as regards the first inquiry, before noticing experiments recently made, and which may succeed or may finally fail, it may be well to ascertain what opinions have been entertained among the learned on subjects analogous to this. Have any theories ever been advanced among scientific men, irrespective of this question, which would *make it probable* that any vegetable could be subjected to a transition so violent, as that from wet to dry, and not only survive it, but triumph over it? This is material; because many minds, believing it subversive of nature's laws, calmly conclude, that the few cases of supposed success are accidental, out of course, and upon the regular recurrence of which no one could calculate with the slightest safety.

[Here the manuscript contains quotations at considerable length, from various authorities, to prove, which they do successfully, that many trees and other plants, which naturally grow only in wet and peaty soils, have been successfully cultivated on high and even dry grounds, and both the quality and productiveness thereby improved; and the inference legitimately drawn therefrom is, that there is nothing impossible—nay, nothing im-

probable—in the supposed fact, previous to any experiments, that the cranberry may be removed to upland soils, and there grow luxuriantly, bearing more abundantly, fruit of more excellent quality. These quotations are from Turner's Letters on Sacred History, pages 91, 95 and 157; J. Smith's Introduction to Botany, page 95; Dr. Walker; the London Enclycopædia, article on Gardening.]

The Albany Cultivator, vol. 9, page 93, informs us, on the authority of Loudon, that Sir Joseph Banks, who obtained the cranberry from America, raised, on a square of eighteen feet, three and a half bushels, equal to 460 bushels to the acre; and the Boston Cultivator informs us, that it was in the *garden* of Sir Joseph, that the berries grew. Nothing is said of the use of water. The inference is as fair that it was not used as that it was.

Mr. Cole, of the Boston Cultivator, April 5, 1845, remarks as follows: "We have seen cranberries flourish well on land that was sufficiently dry to produce good potatoes; the soil a black loam."

In the Cultivator of Sept. 13, 1845, Mr Cole observes: "As we have had so many inquiries on the cultivation of the cranberry, and as they usually grow in wet ground, we lately noticed particularly a spot that was remarkable for an abundance of excellent fruit, by the side of a piece of water, which was on good tillage land. On examining the soil, we found that it was a dark sandy loam, and we are informed that, beneath a few inches of the dark loam, was a white sand."

The Patent Office Report, for 1845, pp. 430 and 431, contains a discussion in the New York Farmers' Club, during which, Gen. Chandler presented cranberry plants "with their great crop of fruit, &c.," raised by Sullivan Bates, of Bellingham, Mass. He stated that "it was produced by his new method, *transplanting from low grounds to high.* "His success," said Gen. C., "was complete; *he gathered from one acre about four hundred bushels of cranberries in one season.*" The chairman spoke of an experiment of his own. He said he "took from swamps on Gen. Johnson's place, some cranberry plants, and planted them on ground *eighty or a hundred feet above the swamp; they*

thrived, and the fruit was so close together, that one could hardly put the finger in, without touching the cranberries." He afterwards remarked, that the soil was loamy, and that he "watered them well." It does not appear whether he tried any without watering, but boasts of "not losing ten out of the one hundred and fifty plants." It will be interesting to know the fact, that in the experiment make by Winthrop Low, of Essex, although he set out near thirteen hundred plants, (on sods,) yet without any artificial watering, he lost not one.

Thus much for the published accounts that have come to hand. An intelligent gentleman from South Hadley, Mr. Ripley, states orally, that for ten years, (the time of his residence in that town) he has been familiar with a spot of cranberries, growing upon a dry, hungry knoll of sandy loam, bearing plentifully every other year, and some every year. He remarked that, when the soil had been a little broken, the runners were more vigorous and in better bearing than when the sward was firm. Mr. R. also states, that Robert Brainard, of the same town, transplanted cranberry sods from the meadow into his tillage land in June last, (1847) and they have already produced the full-grown cranberry. He is so gratified and surprised at this result, that he intends to enlarge his lot without delay. As evidence of the nature of the soil, Mr. Ripley states that Indian corn was growing in the same field, and potatoes directly alongside.

Abel Burnham, of Essex, exhibited at the cattle-show in Lynn, in September last, a handsome specimen of cranberries, raised upon sixty-four rods of high land,—land which is well known to have been formerly cultivated with Indian corn. As evidence of the hardy and almost indestructible nature of this plant, it is said, by persons upon whom the utmost reliance may be placed, that, in one case at least, the cranberry vine appears to grow in a bed of the purest gravel.

The last case of which it is proposed to speak, though others are by no means wanting, is that of the experiment of Winthrop Low, of Essex, a report of which, accompanied by his statement, will be found in another part of the transactions for this year. The sods were taken dripping from the meadow, in the month of May of the present year, and within a day or two were set

in a soil of sandy loam, a part of yellow appearance, and a smaller part being dark. Mr. L. used no water at all about the plants, and though the quantity of rain in May was small, (two and seven eighths inches only,) yet every vine lived, and, as appears from the report and statement, nearly every hill produced berries. The amount of rain, during the six months beginning with May, has indeed been greater than usual, viz., twenty-five and three eighths inches; in 1846, for the same months, it being but fifteen and seven eighths inches; in 1845, twenty-two and seven eighths inches; in 1844, twenty-one and three quarters; and in 1843, nineteen and three quarters inches. But the soil is not retentive of moisture, and the two or three extra inches of rain, the present year, could have made but little difference on that account. The ground always appears dry in a few hours after a shower, a fact accounted for partly by the porosity of the soil, and partly by the surface itself, which is descending, at the rate of six and one half feet in eight rods. Water could not long stand upon any part of that land, and the whole experiment is a grand triumph over supposed impossibilities. It is true, the vines have not yet had a trial of even a single year. But if the difficult stage of taking root is passed; if the plant has sought and found its proper aliment; if, in short, it has, in its new and strange situation, already taken root downward and borne fruit upward, what other greater difficulty can there be? It is believed there is none.

It is not to be forgotten, that the foregoing facts are in singular contrast with nearly all that has been written and published upon the subject of cranberry culture. The Yarmouth Register seems to lead off, and, coming from Barnstable County, where the Halls, the Hallets, and the Thatchers, have so long been sowing and reaping, its authority seems to be unquestioned. What mode does the "Register" recommend? As quoted in the Pat. Off. Rep. before referred to, this authority says, "the cranberry will live and grow in comparatively dry soils, but *will not bear fruit unless its roots are immersed in water all the year:*" again, "*there must be an abundant supply of water all the year:*" again, "the ground must be saturated with water;" and again, "in a selection of a situation for his cranberry-yard, the culti-

vator must observe, first, whether the soil is of a loose, porous character, easily permeable to water; and, second, whether there will be an abundant supply of water in the driest season." If this is the true mode of cranberry culture, then probably it has seen its glory. But what have been the results under the water system, and what upon the opposite one?

The New England Farmer for 1832, page 348, informs us that Mr. Hall, of Barnstable, who "has been engaged for 20 years in the cultivation of the cranberry, had averaged seventy bushels per acre for ten years, and some seasons had had one hundred bushels." There the roots were undoubtedly kept "saturated with water," because to give "an abundant supply of water" is the universal practice in that county; and yet the maximum quantity is "one hundred bushels per acre;" while Sir Joseph Banks, in his garden, of course without extra water, produced 460 bushels to the acre; and the chairman of the New York Farmers' club gave it as his opinion, after his experiment upon land "eighty to one hundred feet above the swamp," that "five hundred dollars might be obtained for a full crop of an acre;" Mr. Bates, of Bellingham, having gathered "four hundred bushels from an acre in a season, the plants had been transplanted from low grounds to high."

So far, then, as the experiments have proceeded, it is a most gratifying fact, that the cheapest mode of cultivation proves to be the most productive. If the Barnstable theory is wrong, therefore, it is high time the public mind were disabused. That this fruit will bear so great, so violent a change of situation, without damage, nay, with absolute improvement, is remarkable, is astonishing truly; but if it be true that it will, then surely we ought to know it, and have the benefit of it.

There is one other item in the Barnstable mode of culture which requires attention. It is the use of sand. The Yarmouth Register is as full and positive in relation to this, as it was respecting water, and insists that there must be "from four to six inches of sand:" "cover the surface with beach sand,"—"if not, with any sand that does not contain loam, or surface-soil." It is possible that the vines grow in spite of it, rather than in consequence of it. Sir Joseph Banks says nothing of it; the New York

club never heard of it, judging from the reported cases. Mr. Cole was once told that in a certain case there was some, but that it was under the loam or surface-soil, a thing to be excluded at Barnstable altogether. There was none near the vines at South Hadley, as Mr. Ripley declared, that town being some sixty miles from the sea. Mr. Low, in his lot, used sand on a part of it, having been led to it by the public prints, but there is no perceptible difference in the appearance of the vines where it was used and where not. The inference is therefore irresistible, that sand is not indispensable certainly, and probably, not necessary at all.

But it is time to consider the second inquiry, viz: whether it would be profitable to cultivate cranberries upon high land; and it cannot take much time to answer it. If the minimum quantity with Mr. Hall was seventy bushels per acre, and Mr. Bates has easily procured four hundred bushels, and if, according to Mr. Cole, two hundred bushels is a medium crop, what other vegetable, at even one dollar a bushel, begins to compare with it for profit? For it must be recollected that no manure is necessary from beginning to end; and after the vines once cover the ground (and this appears to be in from three to five years,) no further labor is necessary other than that of gathering the berries, and that at an expense of about twenty cents per bushel. All cultivators, however, lay it down as important, that the cattle should be kept off, and not allowed to trample upon them. Here there will necessarily be a loss of fall feed, necessary to be taken into the account in making up the bill of profit and loss.

It may be properly stated, too, on the authority of Mr. Worth, a member of the New York club, that "the cranberry of Russia is larger than that of England, but both of them are scarcely half the size of those raised by Mr. Bates, procured by transplanting from low grounds to high, and of much inferior flavor." If Mr. Worth is accurate in this statement,—and there is no known reason for doubting it,—it is not extravagant to suppose that even foreign markets may open for the American cranberry. Might it not have been a belief in the superiority of the American, to that of the English, that led Sir Joseph Banks to procure the former for his garden culture?

But, without anticipating any conjectured market abroad, there is no reason to believe that the home demand can be at present fully met. Let the public but once know that a supply of this delicious berry can be always and easily had, aye, and be as easily cultivated as the apple itself, if not more so, and the demand would soon outrun the supply. Most families are compelled to rely for half the year upon apples for sauce and pies; and the pickled cucumber, indigestible and dangerous as it is, and often thrown away, as it always ought to be, is retained upon the farmer's table, merely because it is the only thing of the kind known that can be kept through the year; while the voluptuary adds "Spanish Olives," "Walnut Ketchup," and what not, more indigestible and dangerous still. What an opportunity to bring forward and substitute the pure acid of the cranberry! For culinary purposes, it must be cheaper. Apples are held to be unfit for pie or sauce, till every element of the natural flavor almost is destroyed or neutralized by the rose-water and the spice. But give to cranberries the *quantum sufficit* of *one single thing*, "sweet cane," and they never tire. The amount of acid in a single bushel, is not to be overlooked, and the augmented amount especially, when diluted for the taste. When these and other familiar facts are considered, the value and advantage of the fruit in question will begin to be felt and known.

Let as many then as will, go forth, "weeping," if they must, but go forth bearing seed, and I can but think that, in due season, they will return bringing their sheaves with them. The number of those who will continue to doubt whether the vines will "outlive the first year or two," or who will wait to know whether they will survive the winter without having "their roots saturated in water," will always be so large, that the enterprising will find an open field and fair play.

Our country consumes eighteen hundred thousand dollars worth of foreign fruit a year; and of the single spice called pepper, we use a good three million dollars worth a year. With such facts as these before us, can any one for a moment fear an over-supply of the fruit, the cultivation of which it has been the object of this essay to recommend?

Selections from an Essay on the Cultivation of the Oak and other Forest Trees.

BY G. B. PERRY.

Our "good Commonwealth," with a wise and liberal forethought for the prosperity and comfort of after generations, has, by her constituted authorities, offered, through the County Agricultural Societies, liberal rewards to encourage and extend the cultivation of the oak and some other kinds of the forest trees. So far as I have knowledge, these offers have been followed with very limited success. Either from real or imaginary difficulties attendant upon forest cultivation, very few in this, and it is believed in other counties, have made any extended efforts either to raise the trees for their own benefit, or to entitle themselves to the premiums. These difficulties I have supposed, and still suppose, are more imaginary than real, while at the same time they are operating very hurtfully in regard to a great public and private injury.

Before I proceed, I will introduce a remark that may be of service to those about to engage in this matter—which is, that in very few of the cultivated or forest trees is the hybridizing process so prevalent as with the oak. To such an extent does this manifest itself, that I have no recollection of having been with a man into any field or forest covered with this tree, however extensive and particular his previous observations might have been, who did not discover trees possessing some peculiarities which he had not observed before; peculiarities which, if not great enough to constitute a new species, were enough to attract notice, and interest the feelings of those who delight in the wonderful and varied works of God.

Practically, this observation will show that, in selecting seed, where a particular kind of tree is especially desired, the acorns should be taken from bearers which stand at a considerable remove from others, or at least from lots where those alone prevail which, in character, are like those it is wished to raise.

Taking into consideration the character of the soil in most parts of this county, and the probable use to which those who

shall reap the field which we sow, may wish to devote the produce, I am inclined to believe that good economy and good taste unite in recommending, that the chief attention should be confined to the cultivation of the white, gray, yellow and black species. These have each their peculiar properties, fitting them for special uses, and each one for a service which the others will not so well answer—while together they meet most of the necessities which the other kinds, growing freely in this climate, would be able to supply. Other kinds may be raised as matters of taste; a pleasing variety would thus be given to our scenery; and it is believed, in doing this, profit and pleasure would be found to result from the same enterprise.

Two important questions present themselves here, on the right answer to which, depends in no small degree the success of this enterprise.

The first is, Ought the acorns to be planted in the nursery, or in open ground?—in the fall, or in the spring?

The second: How shall the young trees be cultivated and trained?

In respect to the inquiry whether the acorns should be planted in the open ground or in the nursery, there exists a difference of opinion among those who have enjoyed the best means of information, whether we consider the extent of their inquiries, or the results of their own experiments. The same is true in relation to fall and spring planting. The inference which ought to be drawn from them, may be a question of some doubt. It certainly is likely to be of some perplexity to those who are about for the first time to engage in tree cultivation, and may well raise some doubts in the minds of those who have entertained confidence that they had certainly found out the best way. It will not be my purpose at this time to go into a comparison of the actual superiority of one or the other of them, though I am willing to state it as my opinion, that in a large portion of cases in this county where it is proposed to cultivate any number of what is rightly called the *king of the woods*, it will be effected with a less expense of labor, and in a shorter space of time, by cultivating the trees in nurseries, and keeping them there till they are six or more years old, before

they are transferred to an open lot. I think it not unlikely, that in many instances they would be kept with advantage in the nursery till they had attained the age of ten years, and even more. I am inclined also to the belief, that the spring is a better season than the fall to plant the seed. I will add, that in most instances the seed is covered too deeply.

The second question is in respect to the treatment of the young trees. For many years, and to a very great extent, after the cultivation of the forest trees began to attract some attention in this county, there seems to have prevailed an opinion, that they flourished best where the earth was not moved around them; that in fact all attempts at cultivation with plough, harrow, spade or hoe, were contrary to the laws of nature, and very hurtful, if not absolutely destructive. I have often heard statements to this effect made, and have several documents to the same effect, from those whose opinion on the subject is entitled to high consideration; and the impression upon my mind is, that the same opinion, to some extent, is still entertained. This opinion, it is thought, may have had its rise from experiments unhappily made, growing most likely from the want of a proper regard to the fact that, most trees standing near together, the roots run very near the surface. The culture was too deep, and many of the roots were either actually cut off, or much injured in the operation. But whatever may have given rise to this opinion, or may still give prevalence to it, there are so many facts before the public of a different result, as to justify the belief that, when right culture is bestowed, the happy fruits of labor will show themselves as fully among the wild trees of the forest, as in the reclaimed ones of the orchard.

In the cultivation of the oak, so far as the moving and loosening the soil is concerned, care must be taken not to injure the roots. In trimming, it should be remembered that it is an increase of timber, and not, as in an orchard, a crop of apples, which should be consulted.

When a seedling oak springs up, whether from an acorn accidentally falling upon the ground, or placed there by the hand of man, it will for the first year appear very weak, and seem rather

inclined to spread itself out like a creeping vine upon the earth, than to lift itself toward the higher regions. Few whose minds have never been instructed on the subject, would be forward to believe that, from such beginnings, such great results were likely to follow; that this fragile plant should grow to be the giant of the wood! Such, however, are the mighty workings of those innate principles which are called the laws of the material world. In cultivation, it becomes of practical importance whether this apparently feeble plant should be suffered to remain till it gathers strength to raise itself upward, or, after it has spread out its roots to a considerable extent, and become thereby able to collect a considerable nourishment, it may not be wiser to cut it down near the earth, under the expectation, justified by many experiments, that it would send out a sprout which, under these circumstances, would rise up straight, and soon attain a greater length even, than the original stock that had been taken away. The principal reason urged by those who disapprove of this cutting down, is the alleged fact that sprouts will never or rarely attain the size to which the original stock would acquire, nor would they be so compact, strong or enduring. When the sprouts spring from the stumps or roots of large trees, there can, I apprehend, be little doubt of the validity of this objection, so that if timber is the mark looked forward to, it probably must be unwise to depend on a growth from the bottom of large trees. If fuel for the fire is the result sought, the objection has less weight, if we feel any regard should be paid to it. It is very likely, indeed, in most instances, from the great rapidity of growth, that more would be gained from the increase in bulk, than lost in the want of solidity. In the present case, however, if the *cutting* process be adopted, the tree is so small, and bears so small a proportion to the size of a fully developed tree, I must think the objection has but little force, were it true, as this supposes it to be, that the first shooting out of the tree did actually, as time advances, rise up from its recumbent state and stretch its head heavenward. My own belief is, however, that this is seldom the case. From what observation I have been able to make, I am convinced that the top first thrown out, does almost universally die either before or

after a new sprout from near the earth starts forth, and that this process of nature is only seconded by art when the top of the seedling oak, whether in the field or in the nursery, is taken away to facilitate a better-shaped and more vigorous growth. I have witnessed this process in multiplied instances, not only in the oak but in many other forest trees. Very few exceptions, it is apprehended, can be found among the young seedlings which spring in the shade, produced from whatever cause, and not many even in highly cultivated nurseries, even where the young plant stands fully exposed to the brightness of day. I have raised a great many forest trees of different kinds. I have in my nurseries but few which I supposed would not be improved by removing the top after having attained the age of three or four years. I have sometimes judged it necessary to subject them to a second, and, in some instances, to a third process. And I cannot believe, from present appearances, that those who in future will be benefited by them, will find, in consequence of this, that they have lost in the compactness of the wood, strength or durability. I wish a fair experiment could be made. In this way only can the question be fully settled. I know well that it must require many years for a plantation put out for this purpose to mature—more indeed than any of the present generation may live to enjoy; but there will come other generations, who would be great gainers from such an establishment, who, without our forethought, would be left nearly or quite as uncertain as we are, and who could no more see the results of their efforts, than we can ours. As things are, the fathers must labor, and their children, or children's children, must reap the benefits of their labor.

How long it takes an oak to reach its ordinary growth, I do not know that there are enough well-attested facts, certainly I have them not in my possession, to justify me to speak with definiteness. The subject is an important and interesting one, and there is scarcely reason to doubt that, should one devote a little time, he might obtain much useful information. There must be many trees of no inconsiderable age and size in the county, whose springing up must be known and remembered by the aged of the present generation, or handed down from the

generations before their days. The society, in my apprehension, could hardly do a better service, than, by some pecuniary consideration, to encourage justifiable inquiry. It would be of great advantage in their present interesting operations. One fact I will venture to state, proving a personal knowledge of the trees, and of their age, from information by the gentleman on whose property they stood. In this instance there are four yellow oak trees standing nearly in a row—the two outside ones being about twenty feet apart. They stand on the side of a hill, soil a sandy loam,—are forty years old. The largest is estimated to contain two feet or more of wood; the other not so much.

Of the general fitness of our soil to the production of the oak in its full size and greatest strength, we have pleasing demonstration in the majestic oaks which still remain scattered over most of the county, as well as in the safety with which our majestic ships, built of our wood and fashioned by the wise craftiness of our own men, have resisted and out-lived the mighty lifting up of the ocean-wave.

The object which the society is pursuing, is one of great interest. It is an enterprise connected with more and wider results than, at first thought, are likely to be supposed. The mildness of our climate, the purity of the air we breathe, the life and freshness of our water, the plentifulness of refreshing showers, the fulness of the out-gushing springs, the beauty of our scenery, the number and variety of the beautiful songsters of the woods, the facility of raising many of the tender plants, flowers and fruits,—the perfection even of the apples, pears and peaches, which, in addition to the pleasure we derive from a rational use of them, are becoming an article of so extensive a traffic, and a means of so much wealth,—are all, to a lesser or greater extent, connected with the success of this enterprise. From these sources, a most abundant reward would be obtained for all the money and labor expended in carrying it out, were no returns to be expected from the growth of the trees themselves. If we value therefore the wealth or happiness of those who may come after us, or regard the estimation in which we shall be held by those, whose gratified feelings and kind remembrance we wish to secure, we can take no more wise and sure course, than to cover our hills,

ornament our plains, and fill our valleys, with a rich proportion and pleasing varieties of the forest trees—mixing those that put forth their freshness in the spring, with those which, by their evergreen foliage, maintain, in winter season, a pleasing contrast with the whiteness of the drifting snow. With such an inheritance handed down to them, our children's children, made glad by the glory and beauty which they see around, will say that we, their fathers, were a wise and understanding people.

Selections from an Essay on the Cultivation of the Apple.

BY JOHN M. IVES.

This fruit is unquestionably the most profitable, as well as easiest of culture, for the farmer. The earliness of some varieties, and the long-keeping properties of others, render the apple one of the choicest gifts of nature. One of the first and most successful cultivators of this fruit in our country, was William Coxe, of Burlington, in New Jersey, who had in his orchard, some thirty years since, upward of one hundred sorts; many of these trees are now in a thrifty state, particularly those that were *engrafted upon suckers.* We have for some time been convinced *that suckers make good stocks;* and the above, in relation to Coxe's orchards of the apple, (as we were informed during a recent visit to Burlington,) seems to corroborate this. The roots of suckers are more inclined to take a horizontal direction than seedlings, which are apt to extend downwards into a cold sub-soil. Liebig's (the great agricultural chemist,) leading principle is, that the carbon of plants is chiefly derived from the atmosphere; which suggests the importance of admitting air to the roots of plants, by inviting them to the surface. The supply of suckers, however, is so limited, (as at least one half of those taken from around trees have not sufficient roots, and many of them crooked stems,) we must propagate from seed; usually obtained from the pomace of the cider-mill.

Sowing seed. The seed must be sowed in autumn, in drills in well-pulverized soil; keeping the surface loose and free from

weeds. In the spring of the second season, as early as the weather will admit, we select the largest of one year's growth, take them up, shorten their tap-roots, and then plant them out in nursery rows, one foot apart, and three feet between the rows. The following autumn, we generally bud all these within three inches of the ground.

Budding. This is usually done in September, and generally succeeds best when performed in cloudy weather, or in the morning or evening; for the great power of the mid-day sun is apt to dry and shrink the cuttings and buds. In selecting buds, they should be taken from well-ripened shoots, and *not* from immature ones that frequently start from and near the centre of the tree. Cut off the unripe buds upon the extreme end of the shoot, leaving only those that are smooth and well-developed; and also the leaves, leaving about *one half of the leaf-stem*, for the convenience of inserting the buds. Great care should be taken, in raising the bark for the insertion of the bud, that the *cambium* be not injured; this *cambium* is a secretion between the wood and bark. In about three weeks, you will see whether the buds are taken, by their plumpness. If they are shrivelled, you can then ordinarily re-bud, as the bark, in young and thrifty seedlings, will usually peel through the month of September, and often into October. If the buds are well united, and the tree has swelled, or the ligature seems to be cutting the stock, it must be removed. When the budding has been performed late, we occasionally let the bandage remain until the following spring.

Cutting the stock. In the ensuing spring, as soon as the buds commence swelling, we head down the stock with a sloping cut within two inches of the bud; if the tree makes a strong growth during the early part of the season, we then, on the last of July or first of August, cut off the remaining wood, close to the budded shoot. We, in common with nearly all cultivators, bud all nursery trees, in preference to grafting, considering it better in every respect, producing a much stronger growth.

Side-shoots not to be removed. With young trees it has been the practice of some, to trim off the laterals or side-shoots, which causes the trees to make a slender and weeping top; these shoots should not be taken off while the trees are young and thrifty;

the trunk will not grow so fast in circumference, by divesting them of their leaves or side branches.

Preparation of land. We have found, following nature in her mode of enriching soil, that the use of vegetable substances, such as muck, peat-earth, leaf-mould and ashes, is the best dressing for the growth of fruit trees. These we should recommend to be composted with barn-yard manure; hog manure, *unless* well decomposed, we consider as deleterious to fruit trees; air-slacked lime, on the generality of our soils, is beneficial, particularly for the pear tree. Old pasture land is better for fruit trees, than that which has been long under the plough, merely because it is less exhausted, and consequently contains more of that decomposed vegetable matter which is so peculiarly fitted to be the food of trees.

Planting out. Apple trees from the nursery, are planted out at two and three years from the bud. In setting these, whether seedling or sucker stock, they should not be placed deeper in the ground, than they originally stood in the nursery; or if the soil is a deep and moist loam, one inch higher; for we believe that deep planting of the apple tree is a serious evil, and many of the disappointments of the fruit grower may be traced to this cause; it is better to draw up the earth around the tree in the form of a small hillock, than to place them too deep. In shallow planting, the roots will have a horizontal direction given to them, which they will afterwards retain.

Season for Planting. Respecting the best season for transplanting the apple tree; we have, as is most generally practised in our vicinity, set them in the spring; but we find no objection to autumn planting, provided the soil is dry; the fall rains settle the earth closer to the roots; but when the soil is clayey, and the weather damp or wet at planting time, it gets into a state of puddle, and rots the roots in winter, and unless the weather is dry in autumn, it *should* be deferred until the early spring.

Watering newly set Trees. The practice of watering newly set trees after they are planted, by pouring buckets of water around them, is a bad practice, for, besides settling away the soil from the roots, it often, by being thus poured upon the surface, runs into a paste, which hardens by the sun into a cake, ob-

structing the free entrance of the atmosphere into the soil, without which, no plant will thrive. Mulching, (so called,) which is done by placing coarse manure or litter around a tree, will preserve the moisture, and is a much better practice than surface waterings.

Soil for an Orchard. The soil best adapted for an apple orchard, as well as the situation and aspect for the trees, is not so easy to determine, as we cannot set down rules that will not meet with exceptions; but of this we feel confident, that deep rich soils in sheltered situations, are not, as some suppose, the most proper for the apple: for we find that this tree succeeds well in shallow loam; the young wood is always of more moderate growth, and better ripened, than when its roots strike deep into the ground.

Position of an Orchard. The situation of an orchard should neither be in the bottom of a narrow valley, nor on the top of an exposed hill; in the first, the bearing wood is rarely so well ripened, and in the second, the trees are too much exposed to winds; the most desirable site, is the side of a hill which slopes to the south or south-west. In planting out an orchard of standard apple trees, they should be placed in rows, ranging from north to south, or as near to these points as may be; the distance of the rows apart should be forty feet, and the spaces from tree to tree, in the rows, should not be less than from twenty to twenty-five feet. The holes, for the reception of the trees, ought to be circles or squares, of not less than six feet over; the trees should not be permitted to be grass-bound, but the grass or sod, dug out as far as the extent of their branches, during their whole growth. It is not well to raise a crop of tap-rooted vegetables in an orchard; the onion is probably the least injurious in a young or newly set orchard; white beans we find the least exhausting to raise between our nursery rows of young fruit trees.

Pruning. In pruning the apple tree, we have found the spring the most favorable, soon after the swelling of the buds: the sap then being in motion, the wounds soon heal over; if this is done in the fall or winter months, the trees are apt to crack or canker. Every limb taken off should be cut close to the main stem, and, provided the limb is large, a composition of

tar and red ochre, or burgundy pitch and bees-wax, well incorporated, be spread upon the end, to keep out air and moisture. The great principle to be attended to in pruning apple trees, is to cut off all dead, diseased, or useless branches at their base, and thinning others, so that the sun and air may penetrate *to* (*not through*) every part of the tree. Few people have confidence enough to do this effectually; but they may be assured that they would have more and better fruit, were they to retain only one half the number of branches which in general at present exist in most orchards.

Injurious Insects.—Aphides. The insects which injure our fruit trees are various, as well as the methods devised for their extirpation. For the genus of aphis or green fly, which is often found upon the succulent shoots of young apple trees, and which injures their growth, we think that the best preventive operation, is that of good culture. Autumn ploughing also, exposing the larvæ to the frosts of winter, and the moderate use of salt, are destructive to this insect. *Curculio.* The most pernicious enemy however to the apple is the curculio, which, in a chrysalis state, passes the winter in the earth, from thence emerging at about the time the blossoms appear, and depositing its egg in the apple; these eggs produce small maggots, which exist in the fruit, causing it to drop prematurely. The best method we are acquainted with to destroy or lessen their ravages, is to give the ground a top-dressing of coarse salt *early* in April, around each tree, to the spread or extent of its branches, and also to gather up the fruit that drops *daily;* by this course, a check is put to their ravages.

Canker Worm. Various methods have been adopted for their destruction; some apply strips of cloth bound around the body of the tree, smeared with tar, to prevent the ascent of the female or grub; but as they move up in the fall, and even in warm days in the winter, as well as in the spring, this is an uncertain as well as a tedious process. This insect enters the ground near the trunk or body of the tree, rarely, if ever, beyond the spread of the branches; applying lime, ashes and salt, dug in around the trees in September and October, tends greatly to lessen their ravages.

Caterpillar. Mr. Pell's practice is to "touch their nests with a sponge, attached to the end of a pole, dipped in strong spirits of ammonia; the sponge is turned slowly round in the nests, and every insect coming in contact, will be instantly killed." They may be destroyed by the well-known circular brush, invented by the late Col. Pickering. We have found the most effectual way of destroying this pest upon small trees, if begun in time, is to strip them off with the hand, and crush them under the foot: as they do not leave their nests until late in the morning, and return again about four or five in the afternoon, we embrace the opportunity of visiting them *at home.*

The Apple Borer. The apple and quince tree borer is another insect, which is not, however, so common as the caterpillar or canker worm. It is a large, fleshy grub, which enters the tree near the ground, where the bark is tender, girdling the stem. We have never seen but one instance of the insect on our premises—this was upon a quince tree—which was destroyed by thrusting a flexible wire into the hole. A mound of ashes or lime around the trees is said, by Downing, to prevent the attack of the apple borer.

Coccus, or Bark Louse. The apple tree, when young, is apt to be infested with an insect called the bark louse or coccus, which is so near the color of the bark, and adheres so closely, as to be almost imperceptible; it is easily destroyed by a strong mixture of soft soap and hot water applied with a brush to the bark.

Ashes. These various insects are kept down greatly by the use of ashes as a top-dressing of the soil; it is also one of the best manures for trees. Mr. Bridgman says that, in England, "a good farmer would dispense with his barn, rather than be destitute of an ash-house; I have known (says he) farmers to supply the cottagers with as much peat as they could burn, on condition of their saving them the ashes; and there are others that will keep men under pay throughout the year, burning peat, for the same purpose."

Keeping Apples. As regards the best method of keeping winter apples, opinions are various. In Europe, they usually spread their fruit, after gathering it, on a floor to sweat, previous

to their final packing, which is then placed in sand, sawdust, chaff, charcoal, dust or peat earth. In this country, we find the practice of our most experienced growers, is to gather the fruit by hand, and immediately place them in tight flour-barrels, shaking them gently while packing, and then head them up tight; they are then placed in a cool, shady exposure, under a shed exposed to the air, there to remain until it becomes cold, freezing weather, when they are transferred to a cool and dry cellar, placing the barrels *on their sides*, and keeping the cellar dark.

In making a selection of apples, we should, as far as is practicable, endeavor to fix upon those which are found to suit our soil. We have heretofore remarked, that many kinds which are good bearers when in strong and moist soils, for example, the Pickman Pippin, Williams' Favorite, Blue Pearmain, Roxbury Russet, and Ribstone Pippin, are the reverse of this upon our own soil, which is of a light sandy loam; while the Baldwin, Hubbardston Nonsuch, Yellow Bellflower, Danvers Winter Sweet, Minister and Fall Harvey, grow and bear well upon our grounds. The Baldwin and Hubbardston Nonsuch, seem to be at home in almost every variety of soil.

In a report which was made to this society some years since, we remarked that apples originating on any given soil, will be generally better than most of those which are introduced into it; citing the Newtown Pippin, and Pennock's Red Winter, which are first-rate at the south where they originated, but, when fruited in this locality, are found inferior to the Hubbardston Nonsuch, Baldwin, and some others. A close observer at the West (Rev. Mr. Beecher) has recently observed "that the soil and climate so modify the flavor and other qualities of the apple, that there is reason for believing that an apple originating on any given soil, will be better than many which are introduced into it; for though the apple is raised in almost every soil, yet it is probable that each variety affects a particular one: thus I perceive the most popular apples of New England are natives; this to a considerable extent is true of the West."

Among the best varieties of apples in Massachusetts are the "Minister," and the "Mother;" they are of recent origin; the

first-named was raised in Rowley, and is a winter fruit, combining great beauty, productiveness, large size, fine flavor, and late keeping properties. The other is a late fall apple of highest order; it originated in Bolton, and is a large oblong red fruit, of excellent flavor, and a good bearer. No better evidence can be given of the congeniality of the soil of our state for the apple, than the natural production of such fruit as the Baldwin, Minister, Hubbardston Nonsuch, Mother, Roxbury Russet, Danvers Winter Sweet, Aunt Hannah, and the Ben of Reading.

Selections from an Essay on the Cultivation of the Pear.

BY W. D. NORTHEND.

Stocks for the Pear. The different stocks used for the cultivation of the pear, are the quince, white thorn, ash and pear, or free stock. The quince and free stock are most common, although on the ash, the pear grows well, and is less liable to be injured by the frost in the spring, as the sap rises later. The quince stock answers well for a very small garden, or when the cultivator wishes to obtain a great variety, and but few of a kind, as the tree is always a dwarf; but in large gardens the free stock is generally preferred. The quince is short-lived, not usually bearing more than ten or twelve years, and is subject to attacks from the borer. Of free stocks, seedlings are much to be preferred to suckers. The latter are generally deficient in roots, are longer in getting started, are less healthy, and will, when growing, throw up suckers from the roots.

Seeds from natural pears are more sure to vegetate, and produce hardier stocks, than those from grafted fruit. It is important, also, to select the seeds of large pears, as the stocks from them are more thrifty, than those from the seeds of small ones. A friend informs me that, several years since, he planted a seed-bed, one half with seeds of small, and the other half with seeds of large pears, the soil in each part of the bed being of equal richness; and that the result was, the first year the trees from seeds of large pears were thrifty and grew well, while those

from seeds of small pears were puny and stinted; and that a decided difference in the growth of the trees could be distinctly seen during the whole time they were in the nursery.

The seed-bed for pears should be in a rich soil, which should be trenched to the depth of fourteen to eighteen inches, and the sub-soil well mixed with rich compost. The seed should be sowed in the autumn, in wide drills from two to three feet apart, to allow the passage of the cultivator between them. The next summer, the young trees should be thinned out, so that they shall not stand nearer than two to three inches to each other. The ensuing autumn, the trees should be covered with coarse stable manure, six inches deep, or with evergreen boughs. This covering should remain till the last of April or first of May. Young trees are not injured, as is sometimes supposed, by severe cold in winter, but by the frequent freezing and thawing of the ground, in an early spring. They are sometimes, when not protected, thrown entirely out of the ground in the spring, even when the tap-roots are as long or longer than the tree itself, and when thrown out in this manner, the slightest frost is fatal to them. A. W. Dodge, of Hamilton, reared a nursery of young pear trees with great success, several years since, without protecting them in any manner the first winter. But I am inclined to believe that their preservation was to be attributed to the propitious season, rather than to their favorable location. A friend of mine some four years since, planted a seed-bed in a most favorable situation, and left the trees without any protection the first winter. The result was, that they were all thrown out of the ground and killed by the action of the frost in the spring. The reason that pear trees are thrown out by the frost more easily than any others is, that the first year they have no *lateral* roots to resist the action of the frost. They have but one straight tap-root. The apple and other fruit trees throw out lateral roots the first year, which fasten the trees to the soil so that they cannot be thrown out by the frost. The second year, the trees will need no protection, as by that time they throw out lateral roots. The second spring, the trees should be transplanted from the seed-bed and set out in rows, in the nursery. If the soil is good, they should be budded during

the second and third years of their growth, and, for this purpose, the month of August is preferable.

Soil, and preparation of it for transplanting. A good loam, on a dry and loose sub-soil, is the best for the cultivation of the pear. Elevated spots are preferable, and in this climate a southern exposure is always to be chosen. Heavy, rich soils, with hard pan beneath, are unfavorable for the pear. A rich soil tends to force the wood of the tree into a very luxuriant growth at the expense of the fruit, and the wood made on such soils is frequently a late growth, unripe when attacked by the frost in autumn, and liable to be killed by the frozen sap blight; and when covering a clayey sub-soil, usually retains an undue amount of moisture, which is very injurious to the roots of the tree. Some recommend, on such lands, to dig a large hole into the sub-soil, and fill it with properly prepared earth. But this is evidently injudicious, for a complete basin is by that means created, without any outlet, and all the evils of constant moisture and rich soil will follow. The wood of the tree will be forced, and the roots decay, in consequence of such treatment. Pear roots need moisture; but it is injurious for the water to remain and stagnate about them. The sub-soil should be of such character as to allow it to drain off readily. For this reason, the slope of a hill is preferred for standard trees. The sub-soil which is best for the pear is seldom covered with a loam strong enough even for the pear, consequently the land should be properly manured and cultivated before the trees are planted. The best manures for this purpose are muck, meadow-mud, or muscle-bed well pulverized; other manures well composted will answer where the above-mentioned cannot be readily obtained. Where the soil is very light and dry, a top-dressing of clay is very beneficial. The manure should be well rotted and incorporated into the soil before the pear trees are planted.

Transplanting, and best time for doing it. Having selected the spot for pear trees, and prepared the soil for their reception, the next process is the transplanting of the trees. This is usually done when the trees are from two to three years on the bud. Pears grafted on free stocks, should be set out, in gardens, from fifteen to twenty feet apart, and, in orchards, from twenty

to twenty-five feet, to allow sufficient room for the growth of the branches and nourishment for the roots. Pears grafted on the quince stock or thorn, may be set out within eight or ten feet of each other. In planting the tree, a hole should first be made from twelve to twenty inches deep, depending upon the character of the sub-soil, and of width sufficient to embrace all the roots without turning them in. The roots of the tree to be planted, should be carefully examined, and all defective or bruised ones cut off smoothly, and the tap-root, if long, should be severed. The tree should then be carefully inserted in the hole, and good fine loam carefully packed in around the roots, care being taken to press the earth under the roots so as to leave no vacuum. The roots should be spread out horizontally, and great care taken to cover with very fine earth the little fibres from the roots, which are essential to the nourishment of the tree. The tree should not be shaken or pressed down after the dirt is filled in around it, as the effect is to injure and break off the fibres. No manure should be put into the hole with the roots, as in dry weather it heats and burns the roots so as to cause the tree to blight. Care also should be taken not to set the tree too deep, as it is oftentimes fatal. The depth of the nursery is generally sufficient. After the tree is set out, particularly if done in the autumn, the earth should be pressed down around it gently, and the tree surrounded, to a height of twelve or fifteen inches, with a conical mound of earth. The mound serves better than stakes to support the tree, and is also a protection against the frost. The earth should remain until the tree gets firmly rooted, when it may be levelled down. It is always injurious to leave the earth in the autumn so as to form a basin around the trunk of the tree for the water to collect in and freeze. Trees are very frequently winter-killed by being so left.

There seems to be a diversity of opinion among pear growers, as to the best season of the year for transplanting pear trees. Some prefer the autumn, while many prefer the spring. Downing prefers the autumn for light and loose soils, and the spring for heavier land. His view is, that trees set out in the fall, get rooted before winter, and are some weeks more forward in the

spring. These views are more suited to the climate of New York and New Jersey, than of Massachusetts; for I apprehend the experience of pear growers, in this region, will show that the tree, when set out in the fall, does not put out any new roots before the winter sets in. Manning, in his work on trees, says, "The impression, that fibres will form in the autumn from newly set trees, is common, but I have never witnessed it." Cold weather sets in, in this state, so soon after the leaves fall, that there is no time for the trees to get started. Another objection to fall planting is, that the trees, not taking root, are more liable to get disturbed in their places by the storms and high winds, than when set out in the spring. If transplanted in autumn, it should be done as soon as the trees shed their leaves freely.

Treatment after transplanting. A pear tree needs cultivation after it is set out. The ground should be kept open and mellow, and until the tree has been set out six to eight years at the least, the ground should not be laid down to grass, and then not more than one or two years at a time. The best way to enrich the soil about the roots of the tree, is to cover the surface of the ground around the trunk with manure in the autumn, which will serve as a protection against the frost in the winter, and the liquid which leaches from it into the ground will afford proper nourishment for the roots, and in the spring to spade the manure into the ground. This should be done every year. It is better to do it regularly, than to give it an occasional heavy manuring. If the tree should be too luxuriant, it is well to lay bare the roots two or three weeks in the fall, and with a sharp instrument to cut off the tap-root. Air-slacked lime or ashes, applied to the soil, promotes the growth of fruit-spurs and buds. The pear tree needs but very little pruning, except when the branches become diseased.

Diseases of Pear Trees. The principal diseases to which pear trees are subject are *insect blight* and *the frozen sap blight.* The *insect blight* shows itself in June and July. The end of the branch suddenly turns brown, and in a few days black and hard. The insect which causes this, is called the *scolytus pyri.* It is a species of beetle, not more than one tenth of an inch in length. It deposits its eggs in July and August, in or near the

bud. The ensuing season, the insect perforates towards the centre of the branch, and causes the blight. The remedy for this is to cut off and burn the branch some inches below the blighted portion. The symptoms of the *frozen sap blight* are, the appearance of a thick clammy sap, upon incision of the bark of the tree in spring or autumn, and the appearance, in spring and early summer, of shrivelled and black portions of bark on the branches. The disease is caused by the winter setting in before the wood of the pear tree is ripe. The vessels being full, are frozen and thawed with the change of the temperature, and the vitality of the sap is lost, and, instead of performing its usual functions in promoting the growth of the tree, becomes transformed into a slow poison. When the sap rises in the spring, the poisoned sap becomes mixed with it, and is carried to the various branches of the tree, and causes the effects described. The remedy, is to cut off the affected branches as soon as the blight appears. Downing recommends whitewashing the trunk and branches of the tree in the fall, as a preventive against this disease. Whitewash reflects the rays of the sun, and prevents the rapid thawing of the bark, which causes the blight. There is, however, but little to be apprehended with us from the frozen sap blight, except to trees planted in rich and damp soils; and it is only to trees planted in such positions, that the preventive will be useful. In light soils, the wood ripens sufficiently early, to be out of the way of the frost. In addition to the diseases named, the leaves of the pear tree are subject, in July and August, to attacks of the slug-worm. These may be easily destroyed, by applying a mixture of whale-oil soap and water to the leaves, or by throwing wood-ashes on them in damp weather.

Gathering the Fruit. Summer and Fall pears should, with very few exceptions, be gathered before they are fully ripe, and allowed to mature in the house. Some extensive growers have apartments fitted up with shelves expressly for this purpose. Most superior varieties, if permitted to ripen on the trees, become dry and insipid. Another advantage of gathering them before maturity is, that they ripen gradually, and are a longer time in eating. The fruit and trees are also prevented from injury from

storms and high winds, by this method. Winter pears should be allowed to remain on the tree as long as possible without danger of injury from the frost, and when gathered should be carefully packed and kept in a dry place.

Varieties of the Pear. The varieties of the pear are almost endless. New kinds are obtained by crossing, and in the garden of the Horticultural Society at London, more than seven hundred kinds have been proved. Most of these originated in Belgium, although some of the finest, such as the Seckel, the Dix, Buffam's, Dearborn's seedling and Andrew's pears, originated in this country. Many of the Belgian pears, which have been cultivated with great success in that country, have not been fully tested with us. The soil and climate have considerable effect upon the quality of the pear. Varieties, which in one soil and climate are superior, in another are secondary. And of the pears which have been fully tested, it is impossible to select a limited number which may be recommended as decidedly superior, as the tastes of different individuals differ very much in regard to this fruit. In conversation with a nurseryman in Salem some weeks since, upon the comparative excellence of the different varieties, he stated that, of the many varieties in his nursery, he considered the Bartlett the most inferior. Many others entertain the same opinion of this most popular and excellent fruit. This difference of opinion is shown in the replies made by different nurserymen to the inquiries which have been made at different times, through the horticultural papers, as to the best varieties for a small garden. There are few who agree upon a selection. The best way for a person to decide upon a selection is, to try for himself the different varieties, and select according to his taste.

MIDDLESEX AGRICULTURAL SOCIETY.

The Middlesex Society of Husbandmen and Manufacturers, held their annual exhibition, at Concord, on Wednesday the 6th day of October, and in all its departments, consider it unequalled by any former show. The day was pleasant, and the crowd of people, the number and extent and variety of productions offered, proved the unfailing interest in the occasion. The ploughing match was the first in order, and was unusually well contested. It was enlivened by the presence, for the first time, of horse-teams, which seem fast getting into use, and by teams of one pair of oxen and a horse, which are by far the most common in use in this county. The field, which was perfectly level, and in a perfect state for ploughing, presented the most animating spectacle, and compared favorably, in the opinion of distinguished gentlemen present from a distant section of the country, with a race-course, in excitement and animation. The show of animals was large, nearly all the pens being filled with fine specimens. The address was delivered by E. Hasket Derby, Esq., of Newton.

From the reports of committees of this society, and statements accompanying the same, the following selections are made.

On Farms, &c.

In the prosecution of the service to which they were appointed, the committee were called to the examination of seven farms, one reclaimed peat or bog meadow, three specimens of compost manure, and twelve orchards of apple, pear and peach trees.

If it were expedient on this occasion, or if other indispensable duties would afford sufficient time, the committee could fill a

volume with facts and observations concerning the past and present condition of the county, in relation to its agricultural aspect, and its productive capacity; and the contrast thus presented, would exhibit a result highly honorable to the intelligence and industry of the present generation of farmers. It is hoped that some individual, with taste and leisure for the employment, and possessing competent ability to observe and investigate, may be induced to make a thorough agricultural survey of this large and flourishing county. Such a survey, the committee believe, would demonstrate the capability of Middlesex to sustain in plenty, if not in affluence, more than twice its present population. Notwithstanding all our recent improvements—the reclamation of bog meadows, the clearing away of stumps and rocks from mowing and pasture lands, and various other operations that have doubled or trebled the value of many farms, there are still hundreds and thousands of acres which produce nothing valuable. If the owners of such unproductive lands were to give one half of them to those who would cultivate and improve them, and give their attention to the improvement of the other half, such owners would be richer than they now are with the whole. One half the expense and labor that are frequently expended on a hundred acres, would turn to better account if applied to fifty. The largest farms are not always the most productive, and are seldom the most profitable.

These remarks may be thought impertinent and superfluous, and the committee forbear to extend them. As they passed from place to place, they could not refrain from stopping occasionally to look, *unofficially*, at the beautiful meadows, the rich fields of corn, the orchards luxuriantly laden with fruit, and the general indications of prosperity and wealth. The season has been uncommonly favorable for all the agricultural productions that render rural life desirable and happy; and the farmers have generally manifested an ambition to make the beneficent administration of Providence available, and to prove themselves worthy to receive and enjoy its bounty.

The by-laws of this society require, as a preliminary condition of obtaining a premium, that each applicant for a premium on a farm, shall present to the committee a written statement of the

produce of his farm, and the manner and cost of cultivation, &c.; that, in relation to reclaimed peat or bog meadows, there shall be "a full and perfect statement in writing of the bottom, nature, production, and value of the soil in its natural state, method of reclaiming, quantity, quality and value of the crop last produced;"—that, in relation to compost manure, there shall be "a statement in writing, for publication, setting forth the whole process, with a description of the premises, and the number of cattle or swine kept during the year, with suggestions in regard to a future course;" and in relation to fruit trees, there shall be furnished to the committee, "a full statement in writing of the soil, mode of cultivation, and treatment in regard to insects." In order to secure the bounty of the Commonwealth, the president and secretary of the society are required to forward certain information on these subjects to the secretary of State, before the tenth day of January in each year. It is hardly possible for these officers to comply with this requisition of law, without the statements required by our own by-laws, from our own members or the applicants for premiums. The committee are bound in duty to say—although they say it with great reluctance—that these judicious and peremptory requirements are frequently neglected. Previous to the personal examinations of the committee, the present year, only one of the numerous applicants for premiums had offered any description of the subject of his application. The committee were of course obliged to take verbal statements, and write for themselves such particulars as they could obtain in reply to inquiries made at the time. Their examinations were consequently unnecessarily protracted, and their labor increased. These things ought not so to be; and it is respectfully suggested whether future committees should not be excused from the examination of premises, unless the applications for premiums should be accompanied by the statements required.

The committee are pleased to add, that since their examinations, and while this report was in preparation, several gentlemen have furnished the proper statements, which are herewith presented.

The following premiums were awarded, viz:—

Farms.

Charles H. Wilder, Lowell, 1st premium,	$25 00
Mark Fay, Marlborough, 2d do.	20 00
E. A. & A. Lawrence, Pepperell, 3d do.	15 00
Jonathan Rice, Marlborough, 5th do.	12 00
Aaron Fletcher, Carlisle, gratuity,	8 00

Reclaimed Meadows.

Sherman Barrett, Concord, 2d premium,	12 00

Compost Manure.

Oliver C. Rogers, Woburn, 1st premium,	10 00
John Kendall, Marlborough, 2d do.,	5 00

Apple Trees.

Benjamin Wheeler, Framingham, 1st premium,	15 00
Lyman Tiffany, do., 2d do,	12 00
Calvin Weston, Lincoln, do., 3d do,,	8 00

Peach Trees.

Elbridge G. Whittemore, Ashland,	10 00
Charles Twitchell,	5 00
Elijah Hale, Stow, gratuity,	5 00

Pear Trees.

Titus Bullard, Holliston, 1st premium,	10 00
John A. Fitch, Hopkinton, 2d do.,	5 00

Respectfully submitted.

JOS. T. BUCKINGHAM,
BENJAMIN WHEELER,
OLIVER C. ROGERS,
} *Committee.*

Charles H. Wilder's Statement.

My farm consists of thirty-three acres of land, twenty-seven of which, in the year 1837, were wholly in an uncultivated state;

about twelve acres being covered with wood, and the remainder, an old worn-out pasture, partially grown up to white birches, shrub pines and blueberry bushes. The other six-acre lot was purchased in 1841, then in grass, and producing about one ton to the acre of hay of a poor quality,—it being low wet ground. The soil on about one half the farm is a light sandy loam, with a sandy sub-soil; the other half is of a sandy loam, somewhat stony, and on a hard stony sub-soil. I have this year in grass twenty-one acres, from which I have kept five cows from the first of June, by soiling, and cut about thirty-two tons of hay. I shall have three tons of dried corn-fodder, raised after a crop of hay, a quantity of turnips, and after-grass enough to keep my cows till foddering-time in the fall. I have four and a half acres of corn, the product of which I estimate at three hundred bushels, and a large quantity of fodder, it being a very large growth;—three acres of winter rye, from which are threshed and measured seventy-six bushels;—one and a half acre of potatoes, producing two hundred and fifty bushels;—two acres in carrots and other vegetables, from which I have sold twenty-eight dollars worth of green peas, and calculate to have four hundred bushels of carrots; about twenty dollars worth of garden vegetables, (besides a supply for the family,) and a quantity of turnips after peas; also three bushels of dry peas. The other acre is taken up with buildings, yards and roads. I can keep next winter (with the help of corn-fodder and roots) ten cows and three horses, and sell fifteen tons of hay. In the years 1844 and '45, I kept nine cows, three horses, and four, a part of the time. Last winter I kept five cows and four horses, and sold one hundred and thirty dollars worth of hay.

I plough my dry mowing ground up once in three to six years, manure well, hoe one or two years, and stock down again with rye or oats in the spring, or sometimes in August, after turning in the stubble. My low mowing ground I top-dress once in about three years, and sometimes plough and stock down in August, with a dressing of fine manure on the inverted soil. My tillage ground I plough ten inches deep, and sometimes deeper, in the fall, manure in the spring at the rate of about forty loads to the acre, spread and ploughed in.

There are, on the farm, about five hundred young fruit trees, of the best varieties, including three hundred apple, and two hundred peach, pear, plum and cherry trees.

My farm work is so connected with my other business, that I cannot make any accurate statement of the expense of carrying it on, but judge it to be equal to two good men's work during eight months, and one four months in the year. I keep two horses to do the work on the farm, and work them out half the time besides.

Lowell, Sept. 14th, 1847.

Mark Fay's Statement.

On my farm, the quantity of improved land is about 25 acres, divided as follows :—This season about 6 acres in corn and potatoes ; two acres of oats; 12 acres of mowing, and the remainder in pasturing. When I bought it, twelve years ago, I kept one cow in summer, and three cows and a horse on hay the first year, and had no hay to sell. The last year, I kept three cows in summer, and twelve cows and a horse on hay. Nine of the cows gave milk through the winter and spring. I sold, in hay and rowen, what amounted to $108 25 of the last year's crop. I have built, within the twelve years, about 250 rods of wall. Within nine years, I have raised and set over 200 grafted apple trees, which are now beginning to bear. I have also topped about fifty old apple trees, part of which are now in a bearing state. I bought the bog meadow, which I showed you, eleven years ago, at $9 per acre, which was not more than the worth of the wood on said land. I have reclaimed about nine acres of the meadow. More than half has been reclaimed since I received a premium, five or six years ago. I now consider the land to be worth at least $100 per acre.

A statement of my process of making compost manure, may be of service to some who have such materials as I have. I take brake bogs and such as will not readily decompose, (or

peat mud, after drying a week or ten days, will answer the same purpose;) I make a windrow of these materials, by the side of the hard land, and set it on fire; then plough the turf on the upland, and cover this windrow with turf and loam, similar to a coalpit. It will then burn four or five weeks. I then, after a rain, mix the whole together, which makes a good and cheap manure for top-dressing, or to put in the hill the next season. The mud which I take from the ditches, more than I want for my yards, after lying over winter, I level and plant with potatoes, and the next year mix it with horse manure and loam, plough and mix it in the summer, and, in the fall, take it for a top-dressing on the same land from which it is dug, and find it to answer a good purpose, and save the expense of carting.

The following is the substance of my memorandum, as I keep it yearly, showing the amount of sales from the farm. Also the income of my cows, and the loss or gain of buying and selling, as the case may be, commencing the first of October, each year:

Oct. 1, 1846, six cows on hand valued at - -	$ 120 00
Bought in Oct. and Nov. nine cows and heifers at -	139 00
Cash paid for labor in 1846, - - - - -	70 00
	$329 00

The following is the amount of produce sold in 1846. Also the profits on cows from Oct. 1st, 1846, to Sept. 8th, 1847:

Three cows sold for - - - - - -	$68 50
Corn, oats, and potatoes sold, - - - -	159 36
Twenty-six calves sold, deducting first cost, -	161 90
Milk sold, - - - - - - - -	31 90
Eight cows let for one year, - - - -	38 00
One cow let for time of feed, - - - -	10 00
Apples and other fruit, - - - - -	25 00
Hay and rowen sold, - - - - -	108 25
Twelve cows on hand, valued at - - - -	240 00
	$842 91
	329 00
	$513 91

Marlborough, Sept. 14, 1847.

E. A. & A. Lawrence's Statement.

Our farm contains 100 acres,—soil, slate, and gravelly loam; 35 acres mowing and tilling, the remainder pasturage. We plant about six acres; ploughing our grass-ground soon after haying, for corn. We plough in about 50 loads compost manure, from our barn-cellar. We also use ashes, or plaster and ashes, putting a small handful in the hill, which we consider beneficial to the crop; average yield, from 50 to 60 bushels per acre. We have improved about 20 acres of pasture land by planting it with potatoes, manuring in the hill with compost manure, mostly peat or plaster; but, on mowing land, prefer to plough with manure, as for corn; average yield, about 150 bushels per acre. We lay down to grass our upland with grain crops in the spring: meadow and lowland we sow to grass after haying. We have reclaimed three acres of meadow, and five acres of rough pasture land, which produce about two tons per acre: top-dress mowing land, which is too wet to plough. We cut about 30 tons English hay. We winter 20 head of cattle, and sell about $60 worth of hay. We keep a number of swine to increase our manure, and save the wash of the dairy, windfall apples, &c. We dug a cellar under our barn, 25 by 70 feet, connected with the hog-yard by a covered drain for hogs to pass and repass, which, by carting in sods from the roadside, and peat, and keeping the cows in the barn all the nights of the season, increases the quantity and improves the quality of our manure. The fences were poor when we came upon the farm; we have built 350 rods of stone wall, and 70 rods of half-wall; have grafted most of our old apple trees; set out 300 peach trees, 200 apple trees, and 78 pear, plum, cherry, and quince trees; have 75 peach trees in bearing; put ashes around the peach trees, and wash our trees with strong lye. Have used the spring-tooth horse-rake, the past summer, which saved much labor. Our usual help is, to have a boy, and hire labor to the amount of about $50 yearly.

Pepperell, Sept. 14, 1847.

Jonathan Rice's Statement.

I came into possession of my homestead in 1841; built an addition to my house 42 feet long and 18 feet wide; half upright; dug a cellar under the whole of it, and carted the dirt upon the mowing. In 1842, I built a shed to my barn, 30 feet by 18, 12-feet posts, and built about 50 rods of wall. In 1843, I built 50 rods of wall. In 1844, '45, '46, and '47, I built 150 rods, or more, of heavy wall. All the stone for the wall was taken from the mowing, the blasting of which took over five casks of powder.

My homestead contains 34 acres, about one half of which is mowing; the other part, pasturing and ploughing. When I began, I cut about 15 tons of hay,—about 30 tons, now. I have 125 acres of out-lands, pasturing, meadow, and woodland; the whole number of acres, 159.

My barn is 80 by 32 feet; shed 30 by 18, posts 12 feet. The barn is full of hay; 5 tons in stack; the shed is full of straw. I estimate my hay at 50 tons,—30 tons of English, and 20 of meadow. I raise from 125 to 150 bushels of corn, and 300 to 450 bushels of potatoes. In years past, 75 to 100 bushels of oats, and 25 to 30 bushels of barley. I have set about 300 grafts. Since I began to "make the rough smooth," two men will mow it as quick as three did formerly, and not dull their scythes.

Marlborough, Sept. 13, 1847.

Aaron Fletcher's Statement.

My farm contains about 75 acres, and, when I entered on it in 1839, there were four acres of English mowing, and about six acres of meadow, about two acres in tillage and the rest pasture, run up to birches and pines. The farm was badly run out, the walls all down, stones scattered along the sides of the fields, and the buildings very much out of repair. I did not cut over two

tons of English and four tons of meadow hay the first year;—about 30 bushels of corn, 20 bushels of oats, and 50 bushels of potatoes, was all the crop I raised.

Since then, I have hired a man about seven months in the year, with an occasional day's labor, and the rest of the work I have done myself. There are, the present season, about 12 acres of English mowing, about 9 of which have been brought to, since I took the farm, on which I cut about 20 tons this year. I cut about ten tons of meadow-hay, from the meadows which I have ditched and reclaimed to English mowing. I raised this season 30 bushels of rye, 100 of corn, 20 of oats, 10 of buckwheat, and about 100 of potatoes.

Since 1839, I have relaid and piled up the stone into double walls, about 200 rods, and in single walls I have reset as much more. I have dug more than 100 rods of ditches, besides repairing thoroughly my house and other buildings. As to fruit, the apple trees on the place bore nothing but poor cider apples. I have grafted the trees, but they were too far gone for the scions to do well; and I shall have to resort to setting out young trees. As to stock, I have generally kept six cows, a pair of oxen, and a horse, and have raised two hogs a year. I have bought no manure, and have made all I have used, except about six tons of plaster which I have spread.

Carlisle, Oct., 1847.

Reclaimed Meadows.

Sherman Barrett's Statement.

When I came in possession of the two acres of land you examined, it was entirely grown over with brush, alders, &c.; bordered on the side by a deep ditch. It remained in this unproductive state till 1839, when I mowed and burnt it over. The succeeding years, till 1843, I mowed the grass, which was almost worthless; there might be about 800 pounds per year. In the spring of 1843, I tried first to plough it, but could not succeed; I then employed Irishmen to dig up, and turn it over.

In the Fall of 1843, I harrowed over the sods. In the Spring of 1844, I planted it with potatoes, putting on 20 loads to the acre, in hill, of compost manure. The crop of potatoes amounted to one bushel to seven hills, on an average. In 1845, I planted again in the same way; the crop was not so large as that of the previous year, owing to the "rot." After digging the potatoes, I ploughed and sowed it with grass-seed, without manure. The seed did not spring up till the next Spring. The crop of grass cut in 1846, averaged two and a half tons to the acre. In the Fall of 1846, I spread over it 25 loads to the acre, of loam, which had remained in the cow-yard one year. This year, the crop of grass cut on these two acres was judged, by myself, workmen, and neighbors, to be as much as 8 tons. The crop of rowen now standing, is also judged to average one and a half tons to the acre.

Concord, Sept. 6th, 1847.

Compost Manure.

Oliver C. Rogers's Statement.

The pile of compost manure which I offer for premium, has been prepared in the following manner. I have, during the past season, kept 20 cows, two yoke of oxen part of the season, and one horse and six hogs on the manure all the time. The cattle have been kept in the barn at night; and, in the cellar, underneath where they have stood, I have, once a week or fortnight, put five ox-cart loads of mud and loam, to absorb the urine. Leaves and many other articles for manure, have been gathered on the farm and deposited in the cellar for the same purpose. By this process I have upwards of 50 cords of first-rate manure in the term of about eight months. I would recommend to every farmer to have barn cellars, and to make and save more manure and buy less.

Woburn, Oct. 1847.

John Kendall's Statement.

The pile of compost manure which I offer for premium, was prepared in the following manner, to wit: I have kept, during the past year, six cows, one horse, one yoke of oxen, six months only, and four hogs. The cattle have been kept in the barn at night; and in the barn cellar, underneath where they stood, loam, refuse straw, &c., has continually been kept, which, as often as it became impregnated sufficiently with the manure and urine, was transferred to the heap, and fresh loam, &c., put under the cattle, and so on. The hogs have also had a quantity of the same material, together with weeds, and other refuse matter to work upon, which has also been worked in. All that could be scraped from the privy-vault, sink-drain, scrapings of the yard and road, has been worked over and pulverized into its present state.

Marlborough, Oct., 1847.

John K. Hardy's Statement.

I commenced carting mud and loam into my barn cellar early in November last, having just then prepared my barn for that purpose, and I continued to cart occasionally, until April. During this time, I kept, on an average, two swine in the cellar, and two horses, two oxen and one cow in my barn, directly over that part of the cellar devoted to compost. I have kept 60 hens during the winter, and my hen-roost is likewise in the cellar, over the compost heap. That part of the cellar for compost, is 25 by 30 feet, and is 10 feet deep. It is kept lighted in severe cold weather, by glass only; in pleasant weather it is partially open on the south side, but is not allowed to freeze. I began hauling stable manure from Boston, Nov. 1st, and continued to do so when at leisure, until my heap was finished and ready for planting in April. The stable manure, mud, and loam, were principally dropped through the barn floor into the centre of the heap—

also the urine from the cattle. When the hogs failed to keep the heap as level as desirable, it was levelled with a manure fork. My endeavor was to have the whole so mixed, that little or no fermentation should take place, until the whole heap was carted to the field. In this I succeeded, and, as soon as the composting in the field was finished, and the fermentation commenced, I began to use it for planting. In my opinion, no strong manure should be used for the purposes of cultivation, until mixed with some weaker substances, and fermentation commences; and one part stable manure, and two parts mud and loam, when stable manure costs so much as it does here, makes as profitable a compost as any within our reach. And where all the droppings of a stock of cattle are immediately mixed with mud and loam in the cellar, a much greater amount of the latter may be used with good economy.

Amount of materials and labor which formed the heap.

17½ cords stable manure at Boston, well stamped, including one cord of night-soil, - - - -	$39 50
Carting the same as 16 loads, at $3 each, - -	48 00
The carting I did myself with one yoke of oxen and a horse, for which I charge $3 per load, or day's work.	
Carting one cord of oyster shells, - - -	1 00
These shells were put into the middle of the heap in the cellar, in January, and, in April, came out very soft, and, immediately on coming to the air, they decomposed.	
Droppings of the 5 cattle and 2 hogs, say 5 cords at $5 50	27 50
50 cart-loads of loam at 20 cts per load, - -	10 00
50 do do do mud at do, - do, - -	10 00
Corn-butts and litter, a small quantity, - -	3 00
I carted to the field all that was under the barn myself, with one yoke of oxen, in 6 days, at $2 00 per day,	12 00
One man 5 days in mixing the heap with mud and loam in the field, - - - - - -	5 00
Do do overhauling second time, - - -	5 00
Whole expense, - - - -	$161 00

In all, 56 cords of compost, equal to 168 ox-cart loads, at about 96 cents per load. This was immediately applied, broad-cast, to about 11 acres of hard rocky land. It will be seen, that the expense per acre, for a dressing sufficiently large for any common kind of land, is only about $14 50.

Waltham, Sept. 6th, 1847.

Apple Trees.

Benjamin Wheeler's Statement.

The apple trees I offer for premium, forty-eight in number, were set out in the spring of 1843. The soil is of a gravelly nature, and the holes were dug from eighteen inches to two feet deep. A quantity of peat-mud was put into the holes at the time the trees were set. The ground has been well tilled, and planted with potatoes and carrots. The other lot of 175 trees was set out in 1845, the land a stony pasture, which was never ploughed before; the stones were dug, and the land planted with potatoes the first year, and the second with corn.

Framingham, Oct. 1847.

Calvin Weston's Statement.

I have one hundred apple trees transplanted in April, 1845, which occupy about 1¼ acres. When set, I applied a shovelful of compost to each tree, mixing it with the soil, and sprinkling it among the roots. The first year I planted; the next year I sowed oats, keeping the land hoed around the trees. In 1847, I planted the land again. During this time, I have given each tree one quart of ashes per year, and no manure. As to insects, they have not troubled me at all. My soil is a gravelly loam.

Lincoln, Oct. 1st, 1847.

Peach Trees.

E. G. Whittemore's Statement.

I have five hundred peach trees, which are now four years old from the stone; eight hundred which are three years old from the stone; seven hundred which are two years old from the stone; and about fifteen hundred that are one year old from the stone. These trees were all set the same year that they were budded. In regard to the mode of cultivation, my manner has been, to keep the soil stirred up light, using a little ashes but no manure. In relation to protecting trees from the ravages of insects, my practice has been to let them entirely alone, as they work only a few weeks. I have come to the conclusion that, in attempting to destroy them, we injure the trees more than the insects do. My trees stand about ten feet from each other.

Ashland, Sept. 15, 1847.

Pear Trees.

Titus Bullard's Statement.

I have in all about 2000 fruit trees, more than 400 of which are pear trees, 700 peach, and the balance, apple, cherry and plum trees. A large number of the trees were transplanted in 1844. I commenced preparing the ground in the autumn preceding, by digging the holes four feet wide and two feet deep. About one third of a load of mud, well mixed with loam, was then put into each hole, and early in April I commenced setting the trees. Before setting the trees, the roots were wet, and then carefully placed in the position in which they were designed to grow, and fine loam was closely packed around them. Where the ground was not at all cultivated, a ridge of land about four or five feet in width was ploughed upon each row. This has been ploughed every year since the trees were set out. Taking into consideration the number set out, and the dry season which fol-

lowed, many more of the trees lived than I could have expected. The soil is of different kinds, the largest part is of a yellow loam, and part of it a black soil. In regard to insects, I am of the opinion that a strong wash of soap-suds or lye is the best remedy.

Holliston, Oct., 1847.

MILCH COWS.

There was awarded

To George M Barrett, of Concord,	1st	premium,		$8 00
" E. J. Leppleman,	do	2d	do	6 00
" Abel Hosmer,	do	3d	do	4 00
" Jonas Viles, Waltham,	do	4th	do	3 00

George M. Barrett's Statement.

The cow I offer for premium is of native breed. The average quantity of milk given by her each month, commencing February 6th, when she calved, was as follows, viz:—

February,	16½	qts.	per day.	June,	14	qts.	per day.
March,	16	"	"	July,	13	"	"
April,	15	"	"	August,	11	"	"
May,	14	"	"	September,	10	"	"

At the present time she gives 10 quarts per day. This average was obtained by measuring the milk two or three days, at the middle of each month. The milk she has given in the eight months has sold, at the door, for $74 76.

Concord, October 6, 1847.

E. J. Leppelman's Statement.

The cows I offer for premium are of the Flanders breed. They were imported from Bremen, about six years ago, into

New Bedford, by John Avery Parker. They are about nine years old. They have been kept through the summer entirely on grass. Through the winter and spring, they had a little meal. One calved in February and the other in March. They have averaged through the summer, while the feed was good, twenty-five quarts each, daily, and since the feed failed, their yield has diminished gradually to about seventeen quarts each at the present time. I have sold the milk, so that I do not know the amount of butter they would make.

Concord, October 5, 1847.

Abel Hosmer's Statement.

The cow I offer for premium, calved April 4th, 1847. The following is the average daily quantity of milk given, after she had calved, viz :—

The first week in May,	. . .	$12\frac{3}{4}$ quarts.
" " June,	. . .	$14\frac{1}{2}$ "
" " July,	. . .	$14\frac{1}{5}$ "
" " August,	. . .	14 "
" " September,	. .	$13\frac{1}{2}$ "
The first five days in October,	. .	$12\frac{1}{2}$ "

Concord, October, 1847.

Jonas Viles' Statement.

The cow I offer for premium calved on the first day of August last, and is four years old. She has given, since that time, from 16 to 18 quarts of milk per day, varying according to her feed. I have kept twelve cows, and she has shared the same as the rest, with the exception of one quart of meal per day.

Waltham, October, 1847.

Carrot Crop.

Amos Wellington's Statement.

The following is a statement of the produce of carrots upou one eighth of an acre of land. The land is a strong deep soil, on which I have raised carrots four years in succession. I put on four loads of barn manure, say about two cords each year, and plough it in, early in the spring, as deep as possible; then about the middle of May plough again, rake the ground over, and sow the seed with a machine, in drills, one foot apart. As soon as the carrots are up so as to be seen, I hoe between the rows to keep the weeds down. When the carrots are up three or four inches, I weed and thin them so as to leave them from three to five inches apart. My crop this year was 101½ baskets, weighing 57½ lbs. per basket.

Estimated Cost of the Crop.

Interest on the land,	75
Cost of seed and sowing,	75
Cost of manure,	5 00
Ploughing,	1 00
Weeding and thinning,	6 50
Harvesting,	3 50
	$17 50

Value of the crop at $10 per ton, 5,836 lbs, $29 21, leaving a profit of $11 71, equal to $93 68 per acre.

Ashby, December 25, 1847.

WORCESTER COUNTY AGRICULTURAL SOCIETY.

In the list of premiums offered by this society for the cattle show and exhibition, held at Worcester the 23d day of September last, the trustees made a change from their former practice, by offering, in part, books to be awarded in premiums, viz: 21 copies of Colman's European Agriculture, 19 copies Farmer's Encyclopedia, 19 Farmer's Dictionary, 42 Washington's Letters on Agriculture, 6 American Shepherd. This change of the manner of paying the premiums, was disapproved of by a portion of the community, who made great efforts to prevent the exhibition of animals and entries for the ploughing match; and they were so far successful as to reduce those entries below the usual number. There did not, however, appear to be less interest manifested on this occasion than at former exhibitions. The disaffected were unable to keep away, and the number of people in attendance was unusually great. The quality of the stock, particularly of fat cattle, cows and young cattle, was superior to that of former years.

The address was delivered by the Hon. David Henshaw, of Leicester.

Ploughing Match.

On repairing to the field of operation, the committee found only four ploughs entered for premium. This is a less number than has been entered for several years past. At the last annual meeting of the society, the trustees were instructed to offer, in part for premiums, certain publications on agriculture, which, together with certain specific sums of money, would be a more useful compensation or remuneration to the several successful competitors, than the premiums hitherto bestowed. The trus-

tees accordingly complied with this requisition, it being understood that this mode has been adopted by other agricultural societies, and especially in the state of New York. The trustees took especial care, in adjusting the several premiums, to add money sufficient, amply to repay all necessary expenses attending those who usually honor the exhibition with their presence as ploughmen; and each would then have left a valuable publication, not only useful for future reference, but as an honorable memento of successful competition.

But it has been understood by the committee, that this manner of bestowing premiums has given umbrage to some who have usually attended the ploughing match, who have accordingly remained at home. This is to be regretted, as the object of our society is not to bestow money, but to diffuse such information among our farmers as shall be more useful than a paltry sum of dollars and cents. But the absence of those who chose to stay at home, as the committee think, from mistaken views, was in a great measure supplied by four other ploughs and ploughmen, who gratuitously offered themselves, not for premiums but for exhibition, and who did good service on the occasion. Upon the whole, the ploughing match was a very respectable exhibition, the work being all done in most excellent order; yes, we say in first-rate order, and will compete in this department with any former show of this society. They have awarded,

To Nathaniel Dodge, of Sutton, Martin's plough, Charles A. Smith, ploughman, work done in one hour and five minutes, first premium, of $5 and Colman's Agriculture.

To Harvey Putnam, of Sutton, Martin's plough, himself ploughman, work done in one hour and six minutes, second premium, of $6 and Farmer's Encyclopedia.

To Tyler Carpenter, of Sutton, Martin's plough, himself ploughman, work done in one hour and four minutes, third premium, of $6 and Washington's Letters; these three being all the regular premiums awarded.

Loren Carpenter, of Charlton, was regularly entered, and, with Martin's plough, did good execution; but as he received the third premium last year, and the committee thought he was

not entitled to a higher premium this year, they were precluded from awarding him any; but they recommend a gratuity of $4 and Farmer's Dictionary. Mr. Carpenter's ploughing was done at a proper depth, but the furrows were cut too narrow; and one desideratum of good ploughing being to turn the sod over, laying it flat and even,—it cannot be so well done by deep ploughing with a narrow cut.

Putnam King, of Sutton, Martin's plough, himself ploughman, though not regularly entered, did good service, doing the work in one hour and eight minutes; and to him we recommend a gratuity of $3 and Washington's Letters.

Royal T. Marble, of Worcester, with two pair of steers, Ruggles and Nourse's plough, did his work in one hour and three minutes. This, the committee were unanimously of opinion, was the best, and we may say, most scientifically performed of the whole ploughing; but as he had two yokes of cattle for his work, (the offer of premium is for the best work with only one yoke,) they recommend a gratuity of $3 and Farmer's Dictionary.

Stephen Salisbury and Asa Matthews exhibited the operation of the sub-soil plough, following another plough, both of Ruggles and Nourse's manufacture. This was a novel and interesting operation, and probably new to most of the spectators. The committee were very much gratified with the performance, perfectly loosening and pulverizing the soil to the depth of sixteen inches, and preparing the ground to resist the effects of severe drought, or extreme wet weather; and the committee think that those who wish to dig for gold, have only to plough deep, like the operation of the sub-soil plough, and they will be sure to find it.

John W. Lincoln also exhibited the operation of the sub-soil plough without the common plough preceding it; the object being the drainage of wet land upon a side-hill, being afterwards sowed with grass-seed and smoothed with a roller. But this being a mere experiment, and having never been tested, the committee can pronounce no opinion upon the result, but hope the farmers of Worcester County may have cause hereafter to thank Col. Lincoln for the experiment.

It is certainly an interesting spectacle to view the exhibition of the ploughing match, each of the competitors contending earnestly, but peacefully, for the prize set before them. We say peacefully; for their swords were literally beaten into ploughshares, and their only offensive weapon being the whip, which was very sparingly used, as well as the voice. We read that Elisha ploughed with twelve yoke of oxen; but we doubt, with all this formidable team, whether the work was as well done as we have seen to-day, with one yoke of four-years-old steers, because he had not the good fortune to have Worcester County cattle and Worcester County ploughs. Dr. Franklin has quaintly said,—

> " He that by the plough would thrive,
> Himself must either hold or drive ;—"

which is very sound doctrine. But Dr. Franklin, with all his philosophy, never dreamed that the same individual could hold and drive both ; or, if he had, he would probably have said that the latter would get rich, before the former would get out of debt.

JAMES DRAPER, *Chairman.*

Fat Cattle.

The whole number of beef cattle offered for inspection was sixteen ; fourteen were entered for premium, and two for exhibition only.

The committee think that Charles Flagg, of East Brookfield, is to be commended for his zeal in adding to the number of beef cattle, by exhibiting his large seven years old ox, which worked till February last, since when he has been fed on shorts and meal, and now weighs 2360 lbs. This ox, not having been raised in the county, could not, according to the regulations of the society, come in for a premium, even had Mr. Flagg expected it.

Halloway Bailey, of Northborough, offered a pair of oxen six years old, which had worked all the season and had no ex-

tra keeping; they were fine cattle, and, by their united weights, (3440 lbs.) show that they come from one of the best farms in the county. The committee award

To Nathaniel Dodge, of Sutton, the first and the second premiums, for the best and the next-best fat ox.

To Ira Hunter, of Worcester, the third premium for his ox, weighing 2035 lbs.

There were six fat cows offered. The Hon. Levi Lincoln, of Worcester, whose zeal for the welfare of this society has been unexampled,—who has yearly contributed largely to the exhibitions of stock,—had in one of the pens a famous Durham cow, surrounded by her descendants, which would do credit to any of our dairy-yards.

THOMAS W. WARD, *Chairman.*

Milch Cows.

There were seven entered for premiums, and eleven for exhibition. The committee award to Charles Wilcox, of New Braintree, the second premium, he being the only competitor who brought himself within the rules. Moses G. Maynard, of Westborough, would have been entitled to the first premium, William S. Lincoln, of Worcester, to the third, Jacob W. Watson, of Princeton, to the fourth, and Nahum Warren, of Shrewsbury, to the fifth, for their respective animals, had they presented such certificates as the Society requires.

The committee are enabled to say that the exhibition of cows exceeded that of the two preceding years, and hope that there will not be a seeming unwillingness on the part of farmers to exhibit, at this annual exhibition, their best stock. The county furnishes many valuable animals for milk, and the number should be increasing. Every person who keeps a cow is more or less interested in this important subject. If its importance is not already felt, the committee cannot expect that any thing from them, within the limits of a report, will awaken that attention which the subject deserves. The inquiry has been made

"What is the *average* time that cows are in milk? Is there a waste of fodder by keeping cows that yield little or no return of profit?"

There should be settled, in order to afford a standard, something like an average quality of milch cows; and no judicious farmer should keep an animal for milk that fell below it; all should strive to go beyond it. It is supposed that a cow of *medium* quality will give, for two months after calving, 12 quarts of milk per day; four months (following), 7 quarts; two months, 4 quarts; one month, 2 quarts; amounting to 1860 quarts, or an average, for nine months, of about seven quarts per day. It will take ten quarts of milk to make one pound of butter, thus producing about 186 lbs., which, at 16 cents, amounts to about $30.

Suppose every farmer to resolve that he would keep no cow that did not hold out as a good milker for ten months in the year, and that did not give, for two months, 16 quarts per day; four months 12 quarts; three months 7; one month 2; yielding 3090 quarts, or, on an average, ten quarts per day for ten months:—is it not practicable to have, throughout the county, cows as good as the last described?

To say that the profit of milch cows is not generally understood, would be saying that farmers are regardless of their own interest: therefore, the committee will only say, that, in their judgment, the average of cows in the county do not reach the first described; and that there are, throughout the Commonwealth, many, exceeding the last, the income from which would be nearly twenty dollars more than the former, making a difference, to the farmer who numbered ten cows, of $200 per year. Cows are creatures of education and circumstances; no young animal of promising appearance for milk should go to the butcher, until there is a full supply of good cows.

Let no undue prejudice prevent the selection of the best animals for breeding. It should be remembered that the *native* cow, or animal most resembling the European cow, on the discovery of this continent, was large, weighing about 1800 lbs., with long woolly mane, thick neck, short tail, tufted at the end. The inhabitants, being in a savage state, had never attempted

to domesticate them; and that our cattle, like ourselves, are of British origin.

The increasing demand for good cows, and the large prices they will command, together with their increased profit, should be sufficient to induce the farmers of this county to lay aside all prejudice, if any exist, in reference to the Devonshire, Ayrshire, or any other shire, and adopt the resolution that, through their efforts, there shall be, ere long, the Worcestershire breed, which shall be respected at home, and sought for abroad.

GEO. DENNY, *Chairman.*

Moses G. Maynard's Statement.

The cow I offer for premium, is one of six cows from my dairy, raised in Shrewsbury, by L. B. Hapgood, one fourth Durham, eight years old last spring, calved the 12th of May last, and is with calf, to calve the last of April next. At the greatest flow of her milk, she gave from 50 to 59 lbs., or 19¾ quarts per day. From the 10th to the 20th of June, she gave 477½ lbs of milk, or 18⅝ quarts per day, allowing 10¼ lbs to the gallon. Her feed was pasturing with my other cows, with the addition of two quarts of meal per day. From the 10th to the 20th of Sept., she gave 349¼ lbs. of milk, or 13⅝ quarts per day. Her feed this Fall has been in my mowing lots with my other cows, with the addition of some corn-fodder, and two quarts of meal per day.

The number of cows kept on my farm is six; five of them are native breed, and one above mentioned ¼ Durham; 5 calves taken off at one week old, at one dollar per head. One, from the best cow, I have on hand now. Two of the above cows calved in November last, and are in calf, to calve in January next. The quantity of milk sold from the above cows since the first of May last, is 1952 gallons, besides one day's milk in a week (most of the time,) has been kept at home for family use.

Westborough, Sept. 22d, 1847.

Charles Wilcox's Statement.

My cow is the native breed, past eight years old; calved May 11th, calf heifer, of good size and quality, taken from the cow when three days old, and raised. Keeping, hay and grass to the 1st of June, after that grass alone, and went in a herd of 20 cows through the season.

Number of pounds given from the 1st of June to the 10th, $502\frac{1}{2}=50\frac{1}{4}$ per day.

Number of quarts given from the 1st of June to the 10th, $206\frac{1}{4}=20\frac{6}{10}$ per day.

Number of pounds given from the 1st of Sept. to the 10th, $351=35\frac{1}{10}$ per day.

Number of quarts given from the 1st of Sept. to the 10th, $144=14\frac{4}{10}$ per day.

New Braintree, Sept., 1847.

William S. Lincoln's Statement.

Below, is a correct statement of the yield of milk, in weight and measure, from my bright red cow, seven years old.

June 1st,	37 lbs.	$16\frac{1}{2}$ qts.	June 6th,	40 lbs.	17 qts.
2d,	39 lbs.	16 qts.	7th,	39 lbs.	16 qts.
3d,	41 lbs.	$16\frac{1}{4}$ qts.	8th,	41 lbs.	17 qts.
4th,	40 lbs.	18 qts.	9th,	$41\frac{1}{2}$ lbs.	18 qts.
5th,	39 lbs.	$15\frac{3}{4}$ qts.	10th,	$40\frac{1}{2}$ lbs.	$16\frac{3}{4}$ qts.
	196 lbs.	$82\frac{1}{2}$ qts.		202 lbs.	$84\frac{3}{4}$ qts.
	202 lbs.	$84\frac{3}{4}$ qts.			

Making 398 lbs. 167 $\frac{1}{4}$ qts. in the above days.

During the above time, this milk was set, skimmed after standing 24 hours, churned, and yielded 16 pounds and a small fraction of butter.

Through forgetfulness of the alteration of the time for the fall trial, the first five days of September had passed before the trial required by the society. But it commenced on the morning of the 6th of Sept., and was continued for ten days with the result below.

Sept. 6th,	24½ lbs.	9½ qts.	Sept. 11th,	25 lbs.	10 qts.
7th,	25 lbs.	11 qts.	12th,	25 lbs.	10 qts.
8th,	25½ lbs.	10¼ qts.	13th,	25 lbs.	11 qts.
9th,	25½ lbs.	10½ qts.	14th,	24½ lbs.	10½ qts.
10th,	26 lbs.	11¼ qts.	15th,	24 lbs.	9¾ qts.
	126½ lbs.	52½ qts.		123½ lbs.	51¼ qts.
	123½ lbs.	51¼ qts.			

Making 250 lbs. 103¾ qts. in the above days.

During the last trial, the yield from each milking was uniformly strained together, two quarts taken morning and night for family use, and the balance set for churning. From this balance there were two separate churnings, producing at the first 4, and at the second 5 pounds each, of well-worked butter, being, if all had been churned, 14 lbs. 10 oz., during ten days.

The cow calved 27th of May, 1847, and the calf (which the committee can judge of,) was weaned after having twice sucked, and was fed, from that time till the last of July, solely on skimmed milk, sweet or sour, as it might happen to be. Subsequently, she has had rowen, corn-stalks, and roots. The cow will calve in May next.

The cow has run in a pasture all summer, with five, and for a great part of the time six, other cows, having no extra feed of any kind, till a few days before the second trial. During the second trial, and subsequently, in addition to pasturage in the same field, fed all summer; she has received, in the stable, at the night milking, four quarts of wheat-shorts, daily, costing from 25 to 30 cents per bushel

Worcester, Sept. 21, 1847.

Jacob W. Watson's Statement.

The following is the yield of milk from my red cow, from June 10th to June 20th.

June 10, 36½,	June 15, 33,
11, 39½,	16, 33¼,
12, 36½,	17, 32½,
13, 36½,	18, 32¾,
14, 36¼,	19, 36¼,
185¼	167¾
167¾	
353	Making 18½ lbs. of butter.

Sept. 10, 20½,	Sept. 15, 24¼,
11, 21,	16, 25,
12, 18¼,	17, 24,
13, 25¾,	18, 23¼,
14, 19¾,	19, 25,
105¼,	121½,
121½,	
226¾,	

Making 13¾ lbs. of butter; having been kept during the season with ten cows.

Princeton, Sept. 22, 1847.

Nahum Warren's Statement.

My cow was four years old last March, of native breed. I made into butter, from the milk this cow gave, thirteen pounds in ten days, in June last. She gave over 200 pounds of milk in the same time. In ten days in September, I made ten pounds of butter, weight of milk over 150 pounds in the same time.

She has made through the summer 3225 pounds of milk. She has been kept alone, with no other feed than hay and pasture. She calved the 20th of April last. The calf was taken from the cow when four days old, which I sold for $2. Raised in Shrewsbury, by myself.

Shrewsbury, Sept. 22, 1847.

Steers.

Of three years old steers there were ten entries, of two years old, ten, and of yearlings, three. In awarding premiums, the committee took into consideration, not only the relative size and appearance of the animals exhibited, but also the promise of the animals, for their usefulness as working oxen, when they shall have arrived at the stature of perfect oxen. Or, in other words, they had regard to the past, present and future, knowing that their early habits and education had much to do with their present appearance and future usefulness, and that a right sort of training, during their early years, is of the greatest importance in regard to their character as oxen.

The committee would congratulate the society, that the promise of oxen in coming years, is so very flattering. And they would again remind the farmers of this county, that much depends upon the early training of steers. Let not this branch of your business be neglected. Spare no pains. Select the most approved breeds; the additional expense will be but trifling when compared with the advantage to be gained in rearing your own cattle and those of the best quality. And do not forget to teach them early to bear the yoke, for thus you will better enable them to endure the "heat and burden of the day."

JOHN A. DANA, *Chairman.*

Poultry.

The committee find twenty-eight varieties of the domestic fowl, and twenty-three more, very little known in this region. Mr.

Bement says of the Dorking fowl from Mowbrays, "they rank in the third degree in the largest of our fowls, well-shaped, having a long, capacious body and short legs, and should have five claws on each foot, and are the most valuable variety for the table." Main says, "This breed is of pure white, and highly esteemed for whiteness and delicacy of flesh, when served upon the table. Since imported to this country, their color, in some degree, has changed, as many now appear to be hawk-colored, and some speckled. This breed makes an excellent stock for the farm or market. They fatten well, lay well, and rear well."

The next variety, undoubtedly the most useful, is the black Poland Topknot fowl. Mowbray says, "The Polanders are not only kept as ornamental, but they are of the most useful varieties, particularly on account of the abundance of eggs they lay, being least inclined to sit of any other breed, whence they are sometimes called 'everlasting layers,' and it is usual to set their eggs under other hens. They fatten as quickly as any other breed, and are in quality similar to the Dorking, their flesh more juicy, and of a richer flavor."

The editor of the Yankee Farmer says, "We have received six Booby hen's eggs. These hens are considered as the greatest layers, as four laid thirty-six eggs in ten days, and showed no disposition to sit." Their other good or bad qualities are not described.

The committee could extend to great length the various speculations now abroad upon the different varieties, the modes of feeding, &c. They have arrived at the conclusion, that the native yellow-leg, plump-breast, rich and juicy meat fowl, for layers, good nurses, and early chickens for the gridiron, are not surpassed by any fowl of foreign breed.

The first premium of $2 was awarded to David R. Gates, of Worcester, for 9 turkeys, only from the fact that they were from a flock of 80.

The next premium of $2, to John H. Hersey, of Worcester, for 8 ducks.

The next premium of $3, to Ebenezer Lincoln, of Grafton, for the best specimen of the barn-yard fowl, mixed breed.

The next premium of $3, to Payson H. Perrin, of Worcester, Chinese breed.

The next premium of $2, to Abram D. Hull, of Worcester, for the next-best barn-yard fowls.

B. TIFFANY, *Chairman.*

Agricultural Implements.

Many of the articles on exhibition were entered by Ruggles, Nourse and Mason, the well established character of whose manufactures, almost renders unnecessary any more particular notice, than a mere enumeration of the names of their entries. Among their entries were 16 ploughs; different kinds and sizes of their celebrated "Eagle," "Sub-soil," "Side-hill," and "Left-hand" ploughs—with and without wheels, cutters, and draft-rods.

In the examination of these ploughs, the attention of the committee was particularly drawn to those upon the "self-sharpening" plan; to the action of the "draft-rods," and to the method of attaching the "cutter" to the plough-beam. This last matter they consider to be a decided improvement upon the old method of attaching the cutter, by a mortise through the beam, inasmuch as it apparently strengthens instead of weakening the beam, and can be raised or lowered with more ease than under the old method. The committee are glad to see that Ruggles & Co. are daily adding to their well-earned reputation, in the production of excellent ploughs; and they improve this opportunity to assent to the opinion so often heretofore given in favor of their superior manufactures.

Ruggles & Co. also exhibited three "Crowell's patent Thermometer Churns." The committee were particularly pleased with these churns, constructed upon true philosophical principles, a thermometer being attached to show the temperature of the cream, and the churn being so constructed as to allow the cream to be nearly surrounded by water heated as desired.

Benjamin Howard, of West Boylston, entered four churns, of

very neat patterns, one of them resembling those above mentioned, except that no thermometer is attached. The "dash" to these churns, the committee deemed superior to that of Ruggles & Co.

C. Hovey & Co., entered five "patent Spiral Straw-cutters." The committee are convinced, that the method of construction is much superior to any other within their knowledge, in the facility of their operation, and the ease with which their work can be performed.

A lot of ploughs from the manufactory of Mr. Martin, in Sutton, and one of Duncan's iron-teeth horse-rakes, all of good patterns and workmanship, were exhibited, and examined by the committee.

C. G. STEVENS, *Chairman.*

Root Crops

The committee were duly notified by the recording secretary, that William S. Lincoln, of Worcester, and Harvey Dodge, of Sutton, had each entered one fourth of an acre of carrots; Willard Earle, of Worcester, had made two entries, of one fourth of an acre each, of carrots; Wm. A. Wheeler, of Worcester, had entered one acre of carrots, and Payson H. Perrin, of Westborough, had entered one half of an acre of carrots; that William R. Hooper, of Worcester, had entered one acre of potatoes; that Harvey Dodge, of Sutton, had made entry of one fourth of an acre of ruta bagas. The committee visited each of the several fields above mentioned, of carrots and ruta bagas, that they might be aided in their judgment by an inspection of the crops in a growing state.

They first visited the land of Mr. Perrin. It was evident that the crop would not be so large as had in former years received the premium of the society. The tops of many of the carrots were unusually large, as if going to seed, and the bottoms quite small. From thence we proceeded to the field of Mr. Dodge, in Sutton. His crop looked well, and the roots of good size; the

land was free from weeds, and the ground had the appearance of having been well cultivated; but the produce of that part appropriated to ruta bagas, promised a lighter harvest than had heretofore been witnessed by a part of the committee from the same field.

They then proceeded to view the land of Willard Earle. He had entered two lots; one of them, however, was less than one fourth of an acre, and, what was more to be regretted, the produce was still more deficient. The other lot did not promise a large yield; the crop would doubtless have been larger, had the roots been fewer in number. From thence, the committee went to Mr. Lincoln's field, on which was only an ordinary crop. It had suffered from the want of being properly thinned, and the land, being a light gravelly soil, had not been sufficiently manured. The committee were informed by Mr. Lincoln, that he had been disappointed in the growth of his roots, and wished to withdraw his claim.

From thence the committee went to the farm of Mr. Wheeler. They found the crop of carrots occupying the same field on which carrots had been grown for four previous years. Some parts of the field were more productive than others. The committee were of opinion that, from the acre, one fourth of an acre might be selected, in one lot, which would yield more carrots than either lot belonging to any of the competitors which they had seen, except that of Mr. Dodge. The land was a light gravel soil, and the crop was larger than could have been expected on such land without very good cultivation.

The rules of the society provide that, "a written statement, giving all the information in relation to such claims, required by the society as above, must be filed with the recording secretary, before the 10th day of November next." On the 9th day of November, Mr. Earle presented his statement; on the 15th, the statement of Mr. Dodge was received, and on the 20th, that of Mr. Perrin. From Mr. Wheeler, no statement has been received.

Of those which were laid before the committee, that from Mr. Dodge was the most satisfactory, not only on account of the amount of his crop, but as to the manner the statement

was made. It was such a statement as a farmer should always make. It told the whole story; it gives the time, as it does the mode, in which the work is done—important particulars, in which the others are deficient. The committee regret that it is not in their power to award a premium to Mr. Dodge for his carrot crop, as his statement was not received within the time prescribed by the rules of the society; and a fear of establishing a precedent, prevents them from recommending that a gratuity be given to him. Mr. Dodge was, the last year, a competitor for a premium on the carrot crop; of which he was deprived by his negligence in making his statement in season. The committee, at that time, thinking that his communication contained valuable information, and as his crop was such as would have entitled him to a premium, if his return had been seasonably made, recommended that a gratuity be given him, which he received. This course should not be continued. He should recollect that a farmer, to insure favorable results, should be prompt in action.

The committee award to Mr. Earle the second premium of Washington's Letters, and $3 for his crop of carrots.

W. R. Hooper made an entry of his potato field, but, unfortunately for him, during the latter part of September, his potatoes were attacked by the rot, which compelled him to dig them; and by the loss occasioned by that disease, his expectations of a large crop were disappointed, and he has made no statement of the quantity which he obtained from his acre. The rot has this season been very prevalent in this vicinity. It commenced about the last week in September, and in a few days, a large proportion of the potatoes were found to be diseased. The disorder was too extensive to be attributed to the effects of insects, or a fungus, but would seem to be occasioned by some atmospheric influence. A farmer of this town had a field of the "Carter" potato, of 3½ acres, from which he expected to obtain not less than 700 bushels. The rot came upon them; he immediately dug over the ground and secured less than two bushels! And this great decay all took place in a very few days from the time they appeared to be in a perfectly healthful state. A farmer in Holden, who has lost but very few potatoes,

attributes his success to scattering a little lime over his potatoes when planted. Another farmer, in this town, who states that he has had but very little rot among his potatoes, believes that it is best to plant potatoes in dry, gravelly soil, early in the season, and manure with well-rotted manure. It seems to be the more general opinion, among farmers, that early planting, on light land, is the best security against the rot.

At the last cattle-show and exhibition by this society, the chairman noticed a basket of potatoes in the hall, which had been presented for exhibition by Rev. W. C. Richards, of New-England Village, Grafton, accompanied by the following statement :—"*Royal blue-heart seedlings*,—the yield of one potato, weighing 7 oz. ; and the produce was 5 pecks, weighing 73 lbs. The seed was cut, planted in drills, May 10th, in dry, gravelly soil." The size of many of the potatoes was large. The quality, as food for man or beast, was not stated; but from the evidence offered, it appeared to be a valuable variety of that most valuable root, even if it should not be good for the table. The chairman requested a friend to make inquiries for him in relation to the character of that kind of potato, and its history. In answer to these inquiries, Mr. Richards had the kindness to send the following letter :—

"Hon. Mr. Lincoln :—

Dear Sir,—The potatoes referred to, and which I raised this season, are, I think, what their name purports. The history of this potato I am at present unable to give you. When at Providence, April 26, 1845, I dined with a gentleman who had on his table a rich, mealy potato, though somewhat dark-colored. He had a few only for table use. He esteemed them very highly. I begged five in number, perhaps of 5 oz. weight apiece; and, on my return, cut them in small pieces and planted in drills, on heavy, wet land; and in autumn dug five pecks of very handsome large ones. This potato I have raised since for my own use, together with the 'Carter.'

Aware that this potato was a great bearer, I thought I would make a trial of its yield. I took two, one of 7 oz. and another of 5 oz. weight, cut and planted in drills on dry, gravelly soil,

moderately manured; hilled them none at all, and on the 22d of September dug 5 pecks from one, and 3 pecks from the other. I was not very exact in the matter, as I told the gentleman who worked for me in planting, that I should get a bushel from the one, and a half-bushel from the other. The rows and ground we staked, as they were planted row by row with others of the same sort. The yield, however, exceeded our expectations. This yield differed very little, if any, from the other rows of the same seed planted by their side, of which I took no exact account in planting. This potato I value for table use, and also as a great bearer.

My usual method of planting potatoes of any kind, is to cut and put three eyes in a hill. I am convinced by repeated trials that farmers use too much seed. Three eyes, spread 5 or 6 inches apart, are decidedly better than three potatoes. Those farmers who have laughed at my method of planting in the Spring, and who have seeded high, have always been compelled to laugh at their own folly in the Fall.

Besides, I have always succeeded best in planting potatoes not more than $1\frac{1}{2}$ or 2 inches below the surface, and in not hilling them at all. Potatoes need the sun as much as any other root. This course I pursued in raising the potatoes I carried to the County Fair at Worcester. Any further inquiries will be cheerfully answered. I have made no calculation as to the quantity from the acre. I have a quantity of very large ones I have reserved for seed, and should be happy to favor you with some, if the gratuity would be acceptable.

Your most obedient servant,

W. C. RICHARDS.

New-England Village, Oct. 1st, 1847.

P. S. It is not unfrequent that some 7 or 8 potatoes are seen crowded out of the ground, and even some very fair ones grow upon the vines. I have one rare, curious specimen of this kind of growth upon the main stalk."

Knowing that some kinds of potatoes, the "Carter," for instance, were more affected by the rot than other kinds, the

chairman wrote to Mr. Richards, requesting him to inform him whether he had discovered the rot among the "Royal Blue Heart Seedlings," and whether he had any experience which satisfied him what was the cause of that disease; and to which Mr. Richards obligingly sent him the following answer:—

"Hon. John W. Lincoln:—

Dear Sir,—I have been delayed in my reply to your inquiries, that I might examine particularly my English seedlings. They have never been affected in past years with the 'disease,' nor have I, after a minute examination of them, discovered any signs of it. I have no opinion I wish to risk after the projection of so many theories, in time past, respecting the cause of the 'disease.' After some observation I have, however, discovered two things.

1st. Potatoes dug before the tops have signs of blast were sound, and have remained so when kept. If this should prove a general fact, may we not infer, that, had the tops been cut close while in this state, or had the potatoes been dug early, more of them, and perhaps all of them, might have been saved.

2nd. That potatoes manured with compost made of mud, ashes, and lime, have been less affected, for three years past, than when planted in other mixtures. Whatever I have communicated, that is of any service to you, is at your disposal.

Your most obedient servant,

W. C. RICHARDS.

N. E. Village, Oct. 14, 1847."

The committee being of the opinion that a desire to introduce a better kind of potato should receive the favorable notice of the society, recommend that a copy of "Washington's Letters" be presented to the Rev. W. C. Richards, as the evidence of their approval of his experiments, and of the communication of the results to the public, and of his mode of cultivation.

JOHN W. LINCOLN,
JOHN HAMMOND,
DARIUS RICE,
Committee.

Willard Earle's Statement.

The state of my carrot land in 1846. It had been planted for three years, and in each year was manured with about eight cords of manure to the acre, say two cords of stable manure and six cords of meadow-mud, composted together, and spread before the last ploughing. In 1846, it was planted with carrots, and manured the same as before, and the yield of carrots I should think to be not far from 600 bushels, (as they were not for premium or sale, I was not particular about measuring them.) The condition of the land in 1847, was the same as in 1846, and the same quantity and quality of manure. In 1847 the land was ploughed, the manure was spread, and then ploughed again and rolled; the carrots sowed in drills ten inches apart, with about two pounds of seed of the Orange carrot; sowed about the 20th May, hoed three times, and harvested the 29th October.

Expense of seed, - - - -	$0 50	
" of manure, - - - -	6 00	
Estimated expense of labor, - -	14 00	—$20 50
The produce was 7950 lbs. of carrots at $10 per ton, - - - -		39 75

which is 2 lbs. short of 142 bushels of 56 lbs.

Worcester, Nov. 9, 1847.

Harvey Dodge's Statement.

The land on which my carrots grew the present season, is the same on which I raised 196 bushels last year. The condition of the land, in the Spring of 1846, was good; it had been planted in corn for two years. In the Spring of 1846, 7½ loads of good stable manure were put on one fourth of an acre, and, in July, two and one half pecks of guano were used, without any apparent effect. The product was as above, 196 bushels, of 56 lbs. each.

The land on which my carrots grew the present season, contains 41 17–20 square rods by measurement; one rod and seventeen twentieths of a rod to carrots more than last year; and is the same field as above described.

Carrot Field, Dr.

1847.		
May 10,	To 8 loads, of 28 bushels to the load, manure,	$8 00
	Carting, spreading, and ploughing the same,	2 00
" 28,	To ploughing, cultivating and fitting for seed,	1 00
June 1,	¾ lb. seed, and sowing with machine, -	87
" 12,	Hoeing with scuffle-hoe between the rows before the plants were up, - - -	50
July,	Labor on same, weeding, &c., - -	3 00
Nov. 5,	Harvesting 5 days, oxen 1 day, - -	6 00
	Interest on land, - - - -	3 00
		$24 37

Credit.

Nov. 5,	By one third manure back for next crop, -	2 67
" "	" 224 bushels carrots, of 56 lbs. each, at 33 cts., - - - - -	73 92
		$76 59

The land on which my ruta bagas were raised the present year, is a part of the same field on which my carrots were raised, and contains the same number of square rods, 41 17–20. The condition of the land in the spring of 1846, was the same as my carrot field; 7½ loads of manure were applied, and sugar-beets were raised on 36 square rods, 156 bushels. In the spring of 1847, the same manure was used as on my carrots; the seed was not sowed until June 20th; otherwise they received the same attention, with the exception of less labor in weeding. This crop promised well until the first part of September, at which time the tops began to blast, and, about the middle of October, they began to decay, and this continued until they were harvested. They were gathered the 10th of November, and the sound ones were carted to the cellar. One hundred and ten bushels was

the product; not more than one half as large as my usual crop has been for the last ten years.

Ruta Baga Field, Dr.

1847.		
May 5,	8 loads manure, at $1, - - -	$8 00
"	Spreading same and ploughing, - -	1 00
May 28,	Ploughing second time, - - -	50
June 19,	Ploughing and fitting land for seed, -	50
" 20,	Seed and sowing, - - - -	50
July	Hoeing and weeding, - - -	2 50
Nov. 10,	Harvesting, 2 hands 1 day, - -	2 00
	Interest on land, - - - -	3 00
		$18 00

Credit.

Nov. 10.	By half manure back for other crops, -	4 00
"	" 110 bushels ruta bagas, at 17 cts. -	18 70
		$22 70

That part of the field on which my carrots were raised, was sub-soiled; or rather my carrots were sub-soiled out, at harvest time in 1846, with decidedly beneficial results for the present or last crop of carrots. The crop was harvested with the same instrument this year. I set out an orchard of apple trees on this same lot of land last spring; they were set 30 feet apart. The growth on them has not been added to the product of carrots and ruta bagas. Although the crop was not materially injured by the trees, yet the rapid growth the present season on my trees, was of consequence to me.

The rot commenced and progressed this season, on my ruta bagas, the same as it has for two years on the potato crop. My round turnips have proved sound, and all other roots. My sugar-beets were uncommonly fine and free from rot. The commencement and termination of this rot in the turnip crop, as well as that of the potato crop, seems to be past finding out.

Sutton, Nov. 13, 1847.

Payson H. Perrin's Statement.

The land on which my carrots were raised, is a deep sandy loam. In the spring of 1846, it was planted with corn, about 30 loads of stable manure being used to the acre. The product was 60 bushels to the acre. The above land was sowed with carrots the present year, and ¼ acre measured off; the produce was 173 bushels, of 56 lbs. each.

Carrot Field, Dr.

To 7 loads manure, 30 bushels to a load, at $1 00, -	$7 00
Carting and spreading the same, - - -	1 00
Ploughing and sub-soiling, - - -	1 50
Ploughing in manure, - - - -	50
¾ lb. of carrot seed, - - - -	60
Sowing with seed-sower, - - - -	25
Hoeing and weeding, - - - -	8 00
Harvesting crop, - - - -	6 50
Interest on land, - - - - -	2 00
	$27 35

Credit.

By half the manure back for other crops, - -	3 50
173 bushels, of 56 lbs. each, carrots, at 25 cts. -	43 25
	$46 75

The product of the above field would have been greater, had it not been for foul seed, mixed with the good, which I sowed; this seed producing large tops, with very small roots.

Westborough, Nov. 18, 1847.

HAMPSHIRE, FRANKLIN AND HAMPDEN AGRICULTURAL SOCIETY.

This Society held its annual Cattle Show and Fair at Northampton on the 13th and 14th days of October last. The exhibition of stock was more full than any other, and far surpassed the most sanguine expectations of the public. The long teams of working cattle from Southampton, Easthampton, Williamsburgh, Hadley, South Hadley, and Conway, reflected great credit upon those towns, and formed a body of these useful animals, which would have done honor to any section of the country. The number and excellence of the milch cows presented, far exceeded that of former exhibitions, and was highly creditable to the Connecticut Valley. The whole number of horned cattle entered for premium, was 500; of horses 94; and of all animals presented at the show 614.

The address was delivered by Professor Charles W. Shepard. The subject was stated to be, in substance—the deficiency of scientific acquirements in agricultural knowledge, and their necessity to a higher success in agriculture. As a means of promoting scientific knowledge among the agricultural population, he recommended the establishment of agricultural schools. At the dinner-table, remarks were made by several individuals. Hon. Edward Dickinson, a former president of the society, observed that the public addresses before the society, for a few years past, were to the point of applying science to agricultural improvement. To direct public attention to something definite upon this subject, he offered the following vote, which was adopted :—

Voted, That this society make application to the next legislature, for the endowment of an institution in the Connecticut

Valley, for instruction in the various departments of agricultural science.

He spoke at considerable length upon this proposition, and was followed by other gentlemen in favor of the same object. Some doubts, however, were expressed whether an agricultural school, reared by the patronage of the state, would be so useful as one established by private munificence.

From the reports of committees, the following selections are made :—

Domestic Manufactures.

The committee, though not able to speak of the comparative merits of this and former exhibitions, are persuaded that there has been no relapse from any preëxisting attainment of skill in the various manufactures offered. Under the impetus which New England industry has of late years been acquiring in this direction, it would seem paradoxical to suppose that there can be any sensible decline in the inventive department of manufactures—the invention of new machinery and new processes—or in the improved fabrication of the product itself, until the time shall come when, in the general vicissitude of things, New England genius and energy shall have migrated to other lands. But the twilight of that declining day, we are persuaded, is yet very far hence; neither will its shadows prevail until one and another city, whose foundations have not yet felt the hammer, shall spring up, and, full-armed with their "weaver's beam," contend with the elder Manchester, Leeds, and Spitalfields, for amicable mastery, in all the known markets of the globe.

The signs of the times all clearly point that way. The selfish period of New England manufactures, and of New England manufacturers, is giving place to the liberal period. Our opulent manufacturers have, all at once, become stricken with a favoritism for the endowment of seats of learning, as well as sites of mills; and, at the same time and at an equal pace with new machinery, are applying propelling powers to education and the higher arts. This is well, and is but the just tribute of successful men to the true sources of success. It is no new idea,

and would require little demonstration, to show the intimate dependence of progress and perfection, in manufactures and the mechanic arts, on an educated public taste It might strike the coarse calico-printer, the weaver of coarse shawls, the upholsterer, and plain cabinet-maker, as a sentimental prescription to bid him, or them, go and discipline their skill and taste by an attentive study of the forms and illustrations of the ancient schools of art. Yet they will readily admit that superiority in design is a grand point gained to every tradesman, and every artisan, in winning the monopoly of the market. But, admitting this, they admit the whole.

The true ideal of design is a classic ideal; the same now—and if so now, we see not why it will not always be the same—which was developed four thousand years ago, in all the exquisite forms, proportions, and harmonies, of Egyptian art; the same ideal which afterwards sailed down the Nile, and assumed new embodiment on every promontory which looked out upon the Ægean or Adriatic. It is true that fashion, now and then when extravagance runs high, may grow erratic, and for a time greatly diverge from the elder dispensation of the true beauty in design—but, after all its perturbations, it will at length resume its proper orbit, and will become, what fashion really is, a revolution of taste about the true ideal of ancient classic art. Thus, in architecture, no rational artist presumes to set up for a purely Native American school. It is true we sometimes see a caricature of art, the gregarious order, if we may so speak, in which Ionic, Corinthian and Doric meet in grotesque union with Barbarian, Scythian and Hebrew, or whatever other order there may be under the sun. Yet, we hardly need say, that a nondescript order like this can never become a prevailing style,—scarcely, even, a transitory fashion. A man may live awhile in such a motley species of monument; but he never can really feel comfortable there. It is, then, by a study of the ancient masters, and a contemplation of the ancient models, that the true ideal of architectural art is attained or approached, and this attainment or approach depends on a more systematic and universal education of the public taste.

There is no nation, perhaps, where this public taste has bet-

ter means of becoming educated by scientific schools, public galleries, and perpetual exhibitions of art, than in France. And precisely in accordance with this fact, we find all the higher branches of manufactures, with which science or design has aught to do, preëminently successful among the French. Compared with them, we, in practice at least, confess ourselves mere "outside barbarians," trimming every thing, or so many things as we do, to the Parisian mode; and this is simply because the Parisian is a cultivated mode. So, likewise, when our manufacturers copy French patterns, and forge in market the French livery for their goods, they do it from no instinctive felonious intent, but because French design proceeds from an inexhaustible classic source, and therefore implies, so far, a more absolute correctness of taste.

But, not to dwell on a theory which rests upon the testimony of many a scientific artisan and operative, the testimony of workers in metals, house-decorators, paper-hangers, upholsterers, silk-manufacturers, and a multitude of others, we pass on, giving a glad welcome to the day when our merchant-princes, and our princely manufacturers, shall find, as they seem to be finding, a more intimate relation between wealth, labor, and the higher arts; and, finding it, shall see and do what enlightened views of their true interest may dictate.

In the department of woolen cloths, the committee were at first surprised to find so little competition. The mystery was solved, however, when they came to examine six pieces of broadcloth, manufactured by the Northampton Woolen Company. The superlatively fine finish imparted to their goods, has given to this company a preëminence, which virtually forecloses competition. From what hidden knowledge this superior skill is derived, is more than the committee could divulge. We doubt whether even the delicate texture of the linnet's wing, dyed in the deep dark gloss of the raven's crest, would produce a fabric more soft and lustrous than the body of these broadcloths. We understand the goods of the company have, for years, carried off the first honors, at all our great public fairs.

Flannels, dressed and undressed, carpetings, hearth-rugs and counterpanes, seem to have engrossed the industry and ingenu-

ity of the ladies, for a considerable share of the past year. One rug, wrought by Eliza A. Bailey, of South Hadley, especially excited the admiration of the committee, and met with a reward of the first premium. The material of this rug was mainly silk, and, though not too fine for drawing premiums, it seemed rather designed to be a *hanging* hearth-rug, than ever to be abjectly trodden under foot.

The samples of book-binding, from J. H. Butler's bindery, were among the best specimens of American binding we have ever seen. The volumes of Harper's Pictorial Bible, bound by his foreman, Mr. Childs, in point of massive mechanism, were scarcely distinguishable from the highest style of English art.

Among the principal novelties in invention, was a self-adjusting railroad frog, exhibited by Wm. Wilson, of Northampton, well known as a man of varied ingenuity.

Wm. Clark, of Northampton, exhibited four specimens of Prouty and Mears's self-sharpening ploughs. The fact that Mr. Clark has adopted any particular pattern of plough, is a sufficient guaranty that there is none superior.

The committee have reserved to the close of their report, a respectful notice of a beautiful specimen of reeled silk, from William G. Hewes, Esq., of New Orleans. It is the result of his first experiment in silk culture, he being entirely uninstructed in the processes which have elsewhere become better understood. We bid Mr. Hewes a prosperous progress in a branch of industry to which, we understand, he designs to apply his unremitted efforts, and offer to his acceptance the society's diploma.

Finally, the committee recommend a gratuity to Dr. Stebbins, of Northampton, for his unremitted interest and courage, in what has been, for years, his favorite study and pursuit—the silk culture. Several varieties of cocoons and silk-worms' eggs were exposed by him, and lent an appropriate feature to the general exhibition of American manufactures.

CHARLES DELANO, *Chairman.*

STOCK.

At our last meeting, your committee adverted to the favorable opportunities afforded by the annual gatherings, for the interchange of opinion, and a more diffused knowledge of successful experiment, and they urged the importance of giving publicity to all new discoveries. It is pleasing to know, that a similar sentiment was entertained by Washington. That illustrious man was elected, in 1786, the first honorary member of the South Carolina Agricultural Society, and, in his letter acknowledging the attention, he says, "it is much to be wished, that every state in the Union would establish a society similar to this; and that these societies would correspond with each other, and fully and regularly impart the results of experiments actually made in husbandry, together with such other useful discoveries, as have stood, or are likely to stand, the test of investigation." To another he writes, "I think that the life of a husbandman, of all others, is the most delightful. It is honorable, it is amusing, and, with judicious management, it is profitable. To societies which have been formed for the encouragement of agriculture, is the perfection to which husbandry has now arrived in England, indebted. It is from experiment, and not from theory, that individuals derive useful knowledge, and the public a benefit."

It is not the province of your committee, to discuss the process of raising stock at any length, but they think it is within the scope of their duty, to point out the sources whence valuable information may be derived. A very useful book has recently been published, treating of this and kindred matters, which, having perused it attentively, they hesitate not to recommend to your attention. It is entitled, "A brief Compend of American Agriculture," by R. L. Allen. A considerable space in it is devoted to the subject of breeding, nutrition, and management of domestic animals.

The present was the best exhibition of teams, that has ever been offered since the formation of the society. The Conway team was preëminent for the size, beauty and symmetry of the cattle, and they were well matched. While their general beauty

was greatly admired, two splendid yokes of oxen, belonging to Consider Arms, claimed particular attention. They were got by a bull of Judge Ball, of Hoosick, in the state of New York.

The whole number of working cattle in teams, was 172 yokes, of which Southampton sent 45 yokes, Easthampton 39, and Hadley 28. The committee award the first premium of $20 to the town of Conway; the second premium of $18 to the town of South Hadley. The towns of Southampton and Easthampton were so well balanced in merit, that a premium of $15 was given to each, and a gratuity of $10 each to the towns of Hadley and Williamsburgh.

The show of working oxen was greater in number, and superior in quality, to any ever before exhibited. In awarding the prizes, the committee were bound, by a recent regulation of the society, that the capabilities and training of the animals should be tested in carts; and this led to the award of some prizes to cattle that would not, under former circumstances, have obtained them. This remark particularly applies to the cattle entered by Merrick Dickinson, of Conway, the training of which was so perfect, as to reflect great credit on the teamster. There were thirteen entries of three years old steers, five entries of two years old, and nine entries of fat cattle.

Of cows, there was a fine collection. The first premium of $5, was awarded to Hervey Strong, of Southampton. A statement in writing was handed to the committee of the quantity of butter his cow made in each of 14 consecutive weeks, from the 20th of February to the 22d of May. The greatest quantity she made in any one week, was 14 lbs. 11 oz.; the smallest, 10 lbs. 1 oz.; the total, in the above period, 173 lbs. 2 oz.; being an average of 12 lbs. 5 oz. per week.

The second premium of $4, was awarded to Dr. Barrett, of Northampton; the third of $3, to John W. Hubbard, of Northampton; the fourth of $2, to Charles H. Clapp, of Hatfield. A cow of Edward Clarke's, and one of Dr. Walker's, and several others, were deserving of premiums; but the committee decided in favor of those respecting which they were furnished with written statements of the amount of their produce.

JOHN EDEN, *Chairman.*

Horses.

Although the committee would not unduly magnify their office above that of other committees appointed for this occasion, still they cannot but feel a litte enthusiasm, in view of the dignity and nobleness of the subject-matter assigned to them. It is evidence of the cultivation and intelligence of this community, that hardly a man can be found among us, whose generous feelings are not excited by the view of a noble horse, and whose indignation does not boil when a greater brute is guilty of cruelty towards him.

We believe that, of all the beasts of draft and burden, the horse is, on the whole, the most useful; and that, if it were announced to man that all the animals which the Creator has given him, save one only, should be taken away from him, and blotted out from the catalogue of useful beasts, and if the liberty were given him of retaining the one he most prized, that one would be the horse. What other beast of burden combines in itself so many useful properties? In certain parts of the world, the camel and the elephant are, in some points, his superiors; and every where the patient ox is exceedingly valuable. Their great strength is a powerful auxiliary to man. But when we consider the great variety of uses and properties of the horse,—his docility, his strength, his hardiness, and the combination of these qualities which he possesses, in some degree, in common with the animals just mentioned, (with his speed, in which he excels them,) we cannot but award him the palm of general superiority.

He is endeared to us, too, by his moral qualities. Though he be less fleet than a locomotive steam-engine, it will be long before the latter will distance him in our affections. When the Creator cursed the ground, he left woman to man to wipe off that sweat of the face in which he was thenceforth to eat his bread; and he also left him the horse, that her duty, in that respect, might be less laborious. And as woman is the noblest type of human life, so, of the brute creation, the horse is worthiest to share with her in alleviating and lessening the toils of man.

In other countries, and perhaps in some parts of our own, we hear much of race-horses, and hunters, and roadsters; but, for practical purposes in this community, power of draft is the quality most desired and most desirable. The use of steam-power answers most of the occasions of rapid motion; while, at the same time, from the small extent of territory to which it can be applied, it creates an increase of transportation by beasts of burden, through those places where it is not used. Hence the importance of constant efforts to improve our breed of horses in their power of draft.

We shall allude to only one more topic, and that is, the very great value, to the farmer, of a general acquaintance with the anatomical structure of the horse. The man who raises his own colts should know how to choose between stallions; and, of all purchasers, he who buys his horses must be a knowing one if he would buy well. He who knows what is the proper size and position of the bones and muscles of a horse, the proper direction and proportion of his limbs, and the various indications of courage, activity, and endurance,—with some of the ordinary symptoms of disease and injury,—is much more likely than another to be possessor of a valuable animal.

The committee are unanimous and unhesitating, in expressing their opinion, that the present is not only the largest, but by far the best exhibition of horses ever offered by this society, within the memory of any member of the committee. They do not say this merely as a matter of form, but because it is their clear and deliberate conviction. Doubtless there is a wide margin for improvement, but, from the present exhibition, they feel greatly encouraged to hope, and expect, that it will take place. If they were to specify the class of horses, in which, in their judgment, the greatest improvement over former years has appeared, it would be that of colts, of three years old and under.

CHARLES F. SMITH, *Chairman.*

Ploughing.

It has not been an easy task for the committee to decide, in every instance, who has been most successful in this match. Poor, indeed, would be the ploughman who could not turn a handsome furrow upon such a sward! Here the result only shows who can do an easy piece of work the best.

The committee suggest that lands more unsubdued be selected on some future occasion, in order more thoroughly to try the skill of the ploughman, and the training of the teams. They also urge deeper ploughing; experiments have every where proved its advantages, especially where it is not sward land.

In awarding premiums, we have taken into account every matter having the slightest bearing upon the performances of which we have judged. Whether the teams were horses or oxen, we paid no attention. The time had little to do with our opinion, since all the work was done in a reasonable time. The lots were $\frac{1}{8}$th acre lots, all ploughed in thirty-five minutes, some of them in twenty-five, and those among the best. The manner in which the teams and ploughmen performed their parts of the labor, the appearance which the furrow-slice presented when turned, and the whole appearance of the land when finished, with other things, have had their weight with us.

There were used, three Ruggles & Co.'s Eagle ploughs, No. 2; three Prouty & Mears's, No. 31; one do. No. 32; one do. S. S. No. 5½; one do. No. 26; one do. No. 23.

HORACE J. HODGES, *Chairman.*

Fruits, Vegetables, and Flowers.

Our president has well enforced upon us the duty and the interest we all have in increased production, by saying that new cities are rising up in our borders, where a ready market will be found for our products. This will hold especially true with

garden vegetables, esculent roots, and fruits,—particularly the minor sort.

One of the projectors of the new city below us, has said that, in five years, we may find great works there, and, of course, a large population. This population will be manufacturers, not producers of the food on which they are to subsist. Where can it as well come from as from the Hamptons and the Hadleys in the immediate vicinity? Let the farmers in this vicinity set themselves diligently to the work. The very next season, this market will be opened for the supply of the laboring pioneers of this great enterprise.

The time has come when every old and useless fruit tree, bearing fruit of no value, should be cut down, and no longer cumber the ground and destroy the crop below it; or be cut off, and its top renewed by grafting into it good and marketable fruit. Cider-making, except for vinegar, is at an end; and the manufacturer of vinegar will pay but eight or ten cents a bushel for apples for this purpose, when good fruit will bring from two to six shillings a bushel, and an average of at least three shillings. The farmer should not tolerate the growth of poor fruit trees on his premises, any more than he would suffer the growth of the burdock or Canada thistle. It is as easy to raise good fruit as that which is bad; and yet how frequently do we see peach, pear, and apple trees, in the gardens and best grounds of the farmer, bearing indifferent and worthless fruit.

The garden vegetables were of good quality, and some of them of monstrous growth. It is rather desirable that fair specimens of good varieties should be exhibited, than monstrosities of any kind; yet monstrous productions show what the soil of this valley will do in this way, and, so far, they are interesting. Justus Boies and Stebbins Lathrop exhibited some sweet potatoes; they were of large growth and fine appearance; and, if of good quality, will be quite an acquisition to our garden esculents. If brought forward in a hotbed and transplanted early, they will have a warmer season for ripening, and doubtless be made of better quality.

Quinces. Two specimens of the best varieties were exhibited; one, the apple or orange quince, the other, a fine specimen of

the pear quince; the former an early, the latter a late variety. The apple quince is truly a noble fruit, large, handsome, and, when cooked, of exceedingly soft texture, and well flavored. The pear quince is more hardy, will keep much longer uncooked or preserved, and, although of a little firmer texture, is rich, and, by many, thought to be of more delicious flavor than the apple quince. Both are good, and are raised in as great perfection on the rich lands of this valley, as any where else in the country. We are at the northern limits of this fruit; above the northern line of Massachusetts, it rarely comes to perfection. The quince is a profitable fruit to raise. The average price in New England, from year to year, is about a dollar a bushel.

Grapes. Isabella, Catawba, and Sweet-water grapes were exhibited. There are two or three varieties of the native grape of New England, worth extensive cultivation. They are much earlier than the Catawbas and Isabellas, and are very large and rich-flavored. Our best varieties of southern and foreign grapes, require ample protection, to insure good crops of ripe fruit; these northern varieties are more hardy, will grow any where, and ripen before the appearance of autumnal frost. The cultivation of the grape is easy, and the product unusually abundant. The ground should be made very rich, winter and summer prunings be judiciously applied, and the crop is quite sure. Soap-suds from the wash-tub is an excellent manure for the grape.

Peaches. The exhibition was too late in the season for the best display of peaches, yet there was considerable variety, and many specimens of fine fruit. Solomon Stoddard presented fine specimens of the late Red Cheek Melicotoon. The bearing trees were from stones planted by Mrs. Stoddard. On his grounds are many specimens of excellent fruits, produced in the same way. This venerable lady is living to enjoy fruits planted by her own hands, at the age of threescore years; an example which, if followed, would fill the country with delicious fruits, adding to the wealth and enjoyment of the community, and bringing with it, health, cheerfulness and good old age.

The farmer is wholly inexcusable, who has not a good variety of peaches on his grounds. The trees are raised with very little care. Budding or engrafting, will insure a variety of excellent

fruit, and, in three or four years, his labor is compensated by a quantity of good fruit, for his own use, and, soon after, a good supply for market. Good fruit always finds a ready market, and commands a high price. A gentleman in Connecticut, who has given some attention to raising fruits, informed the writer that, after his early fruit had all been disposed of at good profits, he sent to New Haven sixty baskets of later peaches, and obtained for them two dollars a basket,—one hundred and twenty dollars for this single parcel of fruit! He probably received three or four times as much for his earlier and rarer productions.

The peach tree is short-lived, and subject to disease and destruction from enemies; but it is easily reproduced, and a little attention will secure a constant supply of bearing trees. The diseased and worthless trees of the garden should be uprooted and removed. Wherever peach trees are killed by the winter, the shortening-in pruning will prove a preservative. Cut off a part of last year's growth, either in the Fall, or in February or March, before the sap circulates, and the tree will live and flourish, bear more and better fruit, shade less ground, and live much longer. To secure good fruit on trees bearing large crops, one half of the green fruit, at least, should be picked off when small, and sometimes much more.

Peach trees require a rich, free soil. They live longer in gravel than in loam, but grow more rapidly in the latter. Yard composts, ashes, chip-manure, and slacked lime, all do well for peaches. The trial of hard coal-ashes, placed around the trees in the spring, has proved a successful protection, prevented too early blossoming, and seems to have protected from the borer and other insects.

Pears. This may be considered the popular fruit of the day. It is but a few years since we were able to name a dozen varieties of good pears in New England, and hardly as many more inferior ones. Now, the cultivators of this fruit can present, on exhibition, 175, and even 200 varieties. The pear tree is of slow growth, but of long duration. When a stock of trees is once in bearing, the work of supplying a competency of good fruit is done; they will bear a century. The Endicot pear tree,

of Danvers, and Prince pear tree, of Chatham, in the old colony, are almost commensurate with the settlement of the country.

The pear tree requires a rich soil, and fair exposure to the sun, to perfect its fruit. The tree needs culture and pruning. Enriching the land increases the production, and renders the fruit larger, fairer, and higher flavored. In addition to other modes of enriching lands for pear trees, it has recently been recommended, to place, about the body and roots, rusty iron and pounded cinders. Lime and ashes do well for pear trees. Grafting pears on quince stocks, or the common thorn, is known to facilitate production, and allow the gardener to raise many varieties on a small spot of land.

The succession of pears that will furnish good varieties of fruit, from the harvest till mid-winter, are the Harvest, which is the earliest, but an indifferent fruit; the Bloodgood, which soon follows, and is fine; Dearborn's Seedling, Jargonelle, Julienne, the Bartlett, Good Christian or Early Sugar, All these ripen in July, August, and September. The Fall pears are the Doyenne, Seckel, Flemish Beauty, St. Ghirlain, Duchesse d'Angouleme, Brown Beurre, and many other of the Beurre and other good pears, which ripen in September, October, and November. The winter pears best known in this vicinity, are the St. Germain, an old variety, Beurre d'Aremberg, Easter Beurre, Vicar of Winkfield, and Winter Nelis.

Apples. There is no better country in the world for apples than New England and New York. The varieties of excellent fruit are numerous, and capable, with care, of being in use the whole year. A gentleman in Connecticut informed the writer, that he had not been out of good apples, sufficient for the use of a small family, for seven successive years. The apple is unquestionably the best and most useful fruit in the world. Some of the very best sorts are seedlings of modern productions. Of these, the Belden Sweeting is one. It was originally found in the grounds of the Rev. Joshua Belden, of Weathersfield, near half a century ago. Henry Bright presented the only specimen that I have ever seen in Massachusetts, to the exhibition to-day. It is excellent for the table and for baking.

The Baldwin apple, also, has an interesting history. It was raised in Middlesex County, many years ago, and was called

the Pecker apple,—as many have supposed, because the woodpecker is fond of visiting it, and of puncturing its bark and wood, in search of insects. Some recent facts, however, lead to the supposition, that its name came from the gentleman who raised the tree, and whose family still have it in possession. It was named the Baldwin, by the Duke of Bridgewater, in England. Loami Baldwin, a distinguished engineer, who laid out and built the Middlesex Canal in this state,—the first great work of the kind in this country,—sent to the Duke of Bridgewater some of these apples. The Duke found them excellent, and gave them the name of Baldwin, in honor of the donor. Trees bearing this fruit, are found in West Springfield, sixty or seventy years old.

There were about sixty baskets of apples, containing from a single plateful, to a bushel of rare specimens. Many of the parcels of fruit were large. The committee would suggest, that a better mode would be, in future, to present half a dozen, that can be exhibited on a plate or small basket; these should be the best specimens of each kind, rather than the largest. Every farmer, interested in these exhibitions, should bring specimens of his best fruit, whether its name is known or not; by such a course, the number of varieties of fruit would be increased, and all the good kinds be seen and propagated.

If the farmer will line his fences, especially his stone walls, with a good variety of winter fruit, in a few years they will be found more profitable than his corn, potato, and oat fields. Last Fall, a farmer in West Springfield gathered seventy-five bushels of Baldwin apples from one tree—fifty-five bushels were sold for half a dollar a bushel, and the residue for twenty-five cents, the whole being worth to him thirty-two dollars and fifty cents. Half a dozen such trees will yield more profit to the farmer, than land which would cost a thousand dollars.

The best summer apples are, the Early Harvest, a very excellent fruit; the Juneating, the Early Strawberry, the Red Astrachan, a fine apple both in appearance and flavor, the Early Bough, a fine sweet apple, the Sopsvine or Sops of Wine, Williams' Favorite, New York Spice, Golden Sweeting, and Summer Pearmain, or Boston apple.

The best autumn varieties are, the Fall Pippin, Fall Harvey, Lyscom, Holland Pippin, Pumpkin Sweeting, Porter, Belden Sweeting, Westfield Seek-no-further, and the Maiden's Blush.

The best winter apples are the Greenings, Baldwin, Yellow Belle Fleur, Danvers Sweet, Golden Harvey, Hubbardston Nonsuch, Pomme Royale, Swaar, Spitzenberg, Kelsey, the Russets, and the Newton Pippins, which will keep till midsummer.

Flowers. Late as the season is, yet beautiful clusters of flowers graced the tables at the hall and at the dinner; they added much to the beauty of the exhibition. The cultivation of flowers, plants, and fruits, is an interesting and healthful employment. It improves the taste, softens the feelings, increases habits of observation, and makes the heart better. A bouquet in the hands of a child, the display of flowers at the window of a dwelling, ever so humble, gives an impression of the good taste and refinement of the possessor. Familiarity with these beauties of nature, makes a favorable impression on the character.

The garden, the grove, the arbor, the rural pathway, lead to contemplations which refine and elevate the feelings, and excite emotions of gratitude and praise to the Great Author of them all.

S. B. WOODWARD, *Chairman.*

Reclaimed Waste and Swamp Land.

Matthew Smith, Jr.'s Statement.

The piece of land which I have reclaimed contains one acre, or a few rods over. It was not what is generally termed a swamp, though very wet. It was covered with knolls, with mud and water between, and the whole filled with stones. It produced bog-brakes and moss, intermixed with coarse grass and fine brakes. Some places on which the water stood a large part of the year, produced nothing, and was let out to frogs. The land was mowed previously to reclaiming it, and produced about enough to pay for getting it. The truth is, the land had had

its way so long, it required some castigation before it would become obedient to wholesome restraint.

The first thing done, was to cut ditches in such a manner as to drain off the stagnant water from the low places. These were stoned up and covered, (under drains,) after which the land was broken up. I say broken up, for it was impossible to plough it so as to turn over the sod. Sometimes the plough would take a piece of turf, six feet by ten, and skin it off. In this way I went over the piece, ploughing it as deep as possible, mixing the mud with the gravel underneath, the sub-soil and dirt from the knolls. This was done in the fall of the year, and to the great amusement of some, to think I should plough such a piece of land.

In the spring, I harrowed thoroughly, spending nearly a day on it, then ploughed and harrowed again, after which I ridged it. The land was then planted to potatoes, and produced 165 bushels. The next spring it was sowed to oats and grass-seed. It yielded 40 bushels of oats. After taking off the crops each year, I drew off the stones, and made of them a wall near by, twenty rods in length. The stones were worth double the cost of getting them off, and were mostly invisible before I commenced reclaiming the land. In the spring, after it was seeded down, I gave it a top-dressing of 20 loads of manure. This was last season, (1845) and, though very dry, I cut over $1\frac{1}{2}$ tons of first-rate quality of hay, herdsgrass, red-top and clover; after which, it produced as much feed as any four acres of mowing land on my farm. The present season, it yielded two tons of hay and a good crop of rowen.

It must be recollected, that this is on land where we do not usually cut but one crop in a year, and are glad to get that. This land is now smooth and level, though formerly so rough as hardly to permit a cart to be driven over it. It was then worth next to nothing; I now consider it worth more than any other acre on my farm. To bring it to its present condition, required some courage, with a due proportion of faith and hope. These were brought freely into exercise, and while it cost much hard labor, a full return has been received, in addition to the crops, by the pleasure it affords in seeing a spot so depraved now so

full of good works. I have also conducted the water from this to a piece of dry land, so as to irrigate about one half an acre and to benefit materially the grass crop.

The expenses for reclaiming this land, are as follows :—

24 rods underdrain, 25 cts. per rod, - - -	$6 00
Breaking up land, 2 men and 2 yoke oxen 1½ days,	5 50
Harrowing, ploughing, and ridging in spring,	4 75
Planting—3 days' work, - - - - -	2 50
Seed—8 bushels potatoes, - - - -	1 33
Hoeing 5 days, and digging nearly the same, -	8 17
Ploughing twice, and harrowing 2d year, man and oxen 2 days, - - - - -	3 33
Oats 3 bushels, and hay-seed, - - - -	1 50
20 loads manure, and work, - - - -	16 00
	$49 08

Receipts from the same, for two years.

1st year, 165 bushels potatoes, 1*s.* per bushel,	$27 50	
2d " 40 bushels oats, 2*s.* per bushel,	13 33	—40 83
		$8 25

Thus it will be seen that the land, when fairly reclaimed, owed me $8 25, for which it has paid me about 4½ tons of hay in the two past years, with fair promises for the future.

Middlefield, Dec. 7, 1846.

HAMPDEN COUNTY AGRICULTURAL SOCIETY.

The fourth annual exhibition of this society, held at Springfield, on the 6th and 7th days of October last, more than realized the highest anticipations in regard to it, and evinced an unabated, if not increased, interest in the objects of the society. In some departments, the exhibition was smaller than on former occasions, but, in most of these instances, it was of a higher order; while, in the other departments, the display of articles was more profuse and varied than ever before.

The show in this county has in former years been distinguishingly marked by the exhibition of manufactures; and this, at the present show, has been its prominent feature, even beyond the exhibitions of the three preceding years.

The show of stock was very good—that of milch cows and swine, being rarely surpassed at any county or state exhibitions of the kind. There were about sixty entries of horses; and the show was excellent in every respect.

The address was delivered by Professor Charles U. Shepard, of Amherst College, and was admirably adapted to the occasion. The two following, are the only reports returned by this society.

On Manures.

The committee to whom the subject of *Manures* was committed, have come to the conclusion, that this subject is of such magnitude as to render it impossible for them to do justice to it in a common report at this time, and would respectfully recommend, that it be made a subject for an address at some future time. Your committee, therefore, content themselves by simply throw-

ing out a few suggestions, in relation to the manufacturing of compost for manures, and their more effectual preservation. Under the general name of manures, may be included all those substances, which, whether deposited in the soil or existing in the atmosphere, are capable of being absorbed by the organs of plants, and of ministering to their nourishment and growth; and portions of which, are furnished by each of the three kingdoms of nature. It is, however, mostly decomposed vegetable remains, and certain of the parts and products of animals, which are ordinarily employed as manures. The salts, likewise, act as such; being filtered by passing through the fine net-work of plants, they enter into their compositions, and stimulate, (as says Chaptal in his Chemistry.)

Manures are of two kinds, nutritive and stimulating; nutritive manures are those which contain such juices or substances as are soluble in water, or which, by their being very minutely divided, may be carried along in connection with it; and all the vegetable and animal juices are of this character. But these alimentary substances, are rarely employed in their natural state; it is thought better, that, before being used, they should be left to rot or ferment; and for the following plain reasons. By the process of fermentation, all these substances are decomposed, and rendered more easily soluble in water; and it is attended, besides this, with the further advantage, that different gases, as Carbonic Acid, Carburetted Hydrogen, Nitrogen, and Ammonia, are disengaged by it, and either serve directly for the food of plants, or as healthy stimulants to their organs of digestion.

Your committee are of opinion, that too little attention is paid, in general, to the mixture of manures by farmers. Farm-yard manures, which are the chief fertilizers, are very considerably improved by the even mixture of those of the horse, the cow, and the pig, &c. And the remark applies to almost all other manures. Your committee would recommend the following mixture, as being possessed of very fertilizing effects.

Take farm-yard manure, one fifteenth or twentieth part, old heaps of weeds, swamp mud, scouring of ditches—any earths, in fact, which contain organic matter, such as sod, green vegetables,

&c., and mix with salt and lime, in proportion of one part salt, to two of lime. The pile to be formed in alternate layers; first the weeds, then the mud, then salt and lime mixed to form one layer, farm-yard manure another, and so on to the end, observing to keep the pile protected from the rain by covering. A chemical action takes place; the mass swells, and the salt is gradually decomposed; and, in the course of three months, if the pile is suffered to remain undisturbed, both the salt and the lime nearly disappear, and two new substances are formed by the combinations into which their constituents have entered, viz: soda and chloride of lime; both of which are excellent manures. "A compound of salt and soot," says an English farmer, "possesses most extraordinary fertilizing effects; but all these mixtures, to preserve their fertilizing properties, should carefully be protected from the rain, to prevent the different salts from being dissolved and leached out of the mass, and thus rendering it almost entirely inert and useless."

Your committee have time to recommend but one article (from the great variety which might be named) as a stimulating manure, which they believe has not been much used by the New England farmer—the sulphate of potass, or common saltpetre, in its crude state, as it is frequently imported and furnished at a cost from three to four dollars per hundred in times of peace. It is very highly recommended by the English farmers, to be used at the rate of one hundred to one and a half hundred to the acre, to be sowed like plaster in moist weather; it has also been used by one of your committee, with marked good effects.

Mr. Kimberly, an English farmer, says, "one hundred pounds of saltpetre, sowed on an acre of sandy soil, is equal, in its fertilizing effects, to twenty-five cubic yards of horse-dung. One of its excellences consists in its enriching powers continuing longer than any other manure—even for several years."

One word further in relation to the importance of covering manures, to protect them from rain. It is believed by your committee, that seven tenths of the farmers of New England, leave their stable manure (which is the best they make) exposed in the open air to all the vicissitudes of the weather, to be drenched and leached by the rain and snow. Most of the barns are con-

structed without any eave-troughs to conduct off the rain and snow; so that it melts, and falls from the roof directly upon the piles of manure thrown from the stable, and thoroughly leaching, dissolving, and thus depriving the manure of all its soluble salts, which make up three fourths of its nutritive properties.

WILLIAM BRIDGMAN, *Chairman.*

Fruits and Flowers.

The committee on fruits and flowers, in submitting their report, congratulate their associates on the incorporation and organization of a Horticultural Society for the county of Hampden. This has been done under an act of the legislature, at its last session; and we may anticipate a greatly increased interest in this important and profitable pursuit. The new society proposes to act fully in concert with our own; and, by occasional exhibitions, to hold out inducements to all, who delight in the products of the garden and orchard, to make their improvements public and acceptable to all. It is greatly to be desired, that this may become truly a county society, and its operations be regarded with favor and patronage by all, far and near, who care about fruits, flowers, and vegetables.

The specimens of fruit, presented at the present fair, indicate, that much more is doing in this department of cultivation, than has usually been supposed. And yet there is undoubtedly a backwardness to go largely into the raising of fruit, on account of the alleged capriciousness of the climate and its admitted severity. The climate of Massachusetts, however, is believed to be, with judicious training and cultivation, not unfavorable, except in extraordinary cases, to most of the standard varieties of fruit.

Great doubt has been expressed about the pear, more particularly; and fears have been entertained, that the pear is actually running out. Fortunately, we have satisfactory evidence, that such fears and doubts are altogether groundless. The specimens afforded at this exhibition assure us that nothing is wanting but care and perseverance.

We have the results of good management, in the statement made by Samuel Colby, of Springfield; from which it appears that, within the last five years, he has successfully cultivated several varieties of the Seckel, the white and gray Doyenne, the Franc Real, the Bartlett, the Jargonelle, several of the Beurre family, the Duchesse d'Angouleme, the Louise Bonne, the Dunmore, the Althorpe Crassane, the Brougham, the Sucre Vert, the Beurre Bosc, and some others. These trees were all obtained from nurseries at Salem, and in the vicinity of Boston. Twenty-four of them are stated, by Mr. Colby, to be in the most thriving condition ; and most of this number to be fine, healthy, and beautifully shaped trees.

The committee make this statement thus particularly, that those may be encouraged, who have heretofore felt nothing but discouragement; and that all, who have it in their power, may be induced to follow so successful and gratifying an example as that of Mr. Colby.

A large proportion of the fruit exhibited was not entered for premiums, but was brought forward by public-spirited individuals. Justin Ely, of West Springfield, presented specimens of the monstrous Pippin, the Van Deveer, the Peck's Pleasant, and other varieties of apples, in very fine order. A. C. Burley, of Wilbraham, furnished the Roxbury Russeting, the Blue Pearmain, the Black Gilliflower, the Boston Sweet, the Baldwin, and some others, which indicated good care and cultivation.

There was a selection of apples, consisting in part of Golden Pippins, Greenings, Pearmains, Gilliflowers, Seek-no-furthers, Dwarf Pippins, None-such, Bluchers, without name or the Society's card, but believed to be from Aaron Bagg, of West Springfield, most of which were very handsome specimens. Festus Stebbins, of Springfield, had several baskets of choice apples in fine order. But the "Pomme Royals," from the beautiful orchard of Judge Morris, are entitled to royal rank in this description of fruit. And by their side must stand, in queenly rank, the equally attractive russets from the grounds of Samuel Baily.

Beautiful selections of flowers and fruit, peaches, pears and grapes, were exhibited by Mrs. Charles Merriam and Mrs.

Richard Bliss ; a basket of the Washington peach, very handsome, by H. L. Bunker, of Springfield ; very fine specimens of grapes, and in great profusion, by Freeman Bangs, of Springfield. There were also rich specimens of pears from the gardens of R. Whittier, of Cabotville, Aaron Ashley, West Springfield, and S. Colby, Springfield. The secretary of the Society, Mr. Vose, also presented for exhibition several varieties of very choice pears from an eastern garden not unknown to fame.

The Isabella grapes, and the rural architecture surrounding them, from the garden of the treasurer of the Society, Mr. Brewer, attracted deservedly great attention. There was also a beautiful specimen of grapes from Otis Briggs.

Where so many have brought forward specimens of fruit of great excellence, purely to show what can be done, and to encourage others, the warmest thanks of the society and of the community are due to them as public benefactors.

To Pliny Merrick, of Wilbraham, who entered twenty varieties of apples,—several of great excellence,—a premium of one dollar is awarded ; to C. B. Kittredge, of Monson, for quinces, fifty cents ; and to Mrs. E. C. Hunt, of Longmeadow, for apples, fifty cents.

In the department of flowers, which so greatly ornamented the hall, and in the tasteful arrangement of which, the thanks of the Society are due to B. K. Bliss and Charles A. Mann, there was, considering the advanced season of the year, an extraordinary proportion.

The splendid bouquets, the fine pots of plants, and the one hundred and fifty dahlias, furnished by Mr. Bliss, attest the sincerity and efficacy of his efforts ; nor is mention to be omitted of the taste and skill of his gardener.

The committee have endeavored to give a general view of the exhibition. They are sure they do but express the common sentiment, in congratulating the community on the success which has attended the exertions of the Society, in behalf of Horticulture.

S. L. PARSONS.

BERKSHIRE COUNTY AGRICULTURAL SOCIETY.

The annual fair and thirty-seventh anniversary of this Society, occurred on the 6th and 7th days of October last, and, as usual, attracted a large number of citizens of the county, and from other states. The weather on the first day was delightful, a genial sun shining all day. The clouds of the second morning threatened rain, and probably deterred many from visiting the scene of the ploughing-match. The temperature of the morning, however, was very favorable for the ox and the horse in the furrow. The department of working oxen was well filled, and it seemed to be admitted by every one that a few pairs excelled any ever before exhibited. There was a great number of cows on the ground, and many very valuable ones. The members of the society, and the interest in its objects, are obviously increasing, and, it is hoped, it has before it a long and glorious future.

The address was delivered by the President of the Society, Joshua R. Lawton, Esq., of Great Barrington.

Agricultural Products.

The committee on agricultural products report, that the farmers of fifteen towns are competitors for the awards of the Society, and that 153 separate fields of grain have been examined—a number far exceeding, we believe, the entries of any previous year. This fact clearly indicates that the society, so long celebrated for the uniform interest manifested for its progressive reputation, appears to be in no danger of falling into disrepute by the apathy of the agriculturalist.

The committee were invited to visit the nurseries of Gen.

Williams, of Stockbridge, and Asahel Foote, of Williamstown, each of whom have several thousand trees three and four years growth from the bud and graft, of vigorous growth and good form, embracing all the improved varieties that our country affords. While these gentlemen are making successful efforts to supply the county with fruit trees, the committee regret to state their belief that the farmers of Berkshire, in this branch of horticulture, are far behind most of the counties in this Commonwealth. How long shall it be said, that our farmers neglect the profit, and forego the luxury, the cheapest and greatest luxury within the reach of all,—good fruit?

From the best information that the committee could obtain, it appears that the hay crop falls short of an average supply, one quarter. This deficiency will, however, be mostly replaced by the great area and great growth of corn, as well as from an unusually increased cultivation of the coarse grains. The great deficiency in the hay crop seems to be the result, on dry and gravelly land, of the extreme drought of the last year, and, on wet and intervale lands, to the lodgment of ice the past winter and spring. The committee are of opinion, that much of the mowing and pasture land so affected, will not give a good return to the owner, until it is re-seeded, either by ploughing or scarifying.

The crops of winter rye, and winter wheat, were much injured from the same causes that produced the light crop of hay. We however found, in our examination, several pieces of winter rye, of astonishing growth, and great profit. Of winter wheat, there was but one entry; this piece was not deemed worthy a premium. This crop appears to have given, the past year, the poorest return for labor, of any crop cultivated in the county.

Of Spring wheat, there were twenty-eight entries. In this branch of the committee's duties, they found it exceedingly difficult to distinguish the best, when almost all the pieces offered were good. The weevil appears to have worked in many places to great extent, but, notwithstanding its ravages, the crop is considerably more than an average, in consequence of which, they consider it their duty to apply the appropriation on winter wheat to the spring crop.

They award:

For the best acre of spring wheat, a new variety here called Himmelah wheat, to Joshua Tillotson, of Lanesboro', $6 00
2d best to Edmund S. Callendar, of Sheffield, - 5 00
3d do. to Charles Hinckley, of Lee, - - 4 00
4th do. to Marshall Sears, of Lenox, - - 3 00

For the best acre of winter rye, to Robert B. Brown, of Egremont, - - - - - 5 00
2d do. to Asahel Sherman, of Lanesborough, - 4 00
3d do. to R. H. Wells, of Adams, - - - 3 00

Thirty-eight pieces of Indian corn were entered, fifteen of which yielded from 200 to 240 bushels of ears per acre, well packed, level or stricken measure. The committee would pay William W. Ward, of Pittsfield, the compliment of having the neatest and best cultivated crop, that fell under their inspection.

For the best acre of corn, in a piece of 10 acres, 12-rowed, giving 240 bushels of ears, to Clement Harrison, of Adams, - - - - - - $6 00
2d do. a piece of 14 acres, 8-rowed, giving 240 bushels of ears, to Nelson Joiner, of Egremont, - 5 00
3d do. a piece of 5 acres, 12-rowed, giving 226 bushels of ears, to Ralph Little, of Sheffield, - - 4 00
4th do. a piece of 5 acres, 8-rowed, giving 200 bushels of ears, all sound, to Wm. W. Ward, of Pittsfield, - - - - - - 3 00
5th do. an extra premium, a piece of 3 acres, 12-rowed, giving 220 bushels of ears, to Reed Mills, of Williamstown, - - - - - 3 00
6th do. an extra premium, a piece of 2 acres, 8-rowed, giving 232 bushels of ears, not all sound, to Avery Williams, of Stockbridge, - - - 2 00

Frederick W. Jones, of Stockbridge, offered an extra good piece of corn, but had cut up a great part of it before examination. The committee think he would have been entitled to a premium, had his corn remained on the hill, but, as they examined all crops with the utmost care, they can only recommend him to another trial, and to keep his crops, until harvested, from

horned cattle in particular. We find the largest yield of 8-rowed corn to be obtained from about 40 hills to the square rod; of 12-rowed corn, about 32 hills to the rod. Bird-lime, ashes, plaster and refuse lime are used by those who get the best crops, all other things being equal.

The oat crop is good. The committee find that the best crops are obtained by heavy seeding, from 3 to 4 bushels to the acre. Twenty-seven pieces were examined.

For the best acre of oats, to Jas. Kellogg, of Sheffield, - $5
2d do. to Joshua R. Lawton, of Gt. Barrington, 4
3d do. to Elias Werden, of Richmond, - 3
4th do. to Henry Colt, of Pittsfield, - - 2
5th do. extra premium, to Wm. Bradley of Lanesboro', 2

Of meslins, there were seven pieces examined, principally of a mixture of wheat and oats. Justus Tower represents that his crop of meslins, as well as an extra good crop of corn, was raised upon land about as poor as can be found in this county; that it has been brought to its present state of high cultivation, by the recent application of lime, ashes, and compost, which reflects great credit on his untiring perseverance in the promotion of agriculture.

Twenty-two fields of barley were examined. This crop is becoming more generally cultivated. It is considered a profitable crop. It does not exhaust the land as much as oats, and is a safe crop for land to be laid down to clover and other kinds of grass.

The potato crop is, in many places, nearly destroyed. The committee are of opinion, that one quarter of the crop in the county is already lost; and that the disease has not yet ceased its operation. Fifteen pieces were examined.

For the best acre of potatoes, long red variety, estimated at 480 bushels, raised on swamp muck, lightly manured, to
Thomas B. Strong, of Pittsfield, - - - $6
2d best, Mercer potatoes, 380 bushels, to
Leonard Tuttle, of Sheffield, - - - - 5
3d best, June Pink-eye, 380 bushels, to
Robert Campbell, of Pittsfield, - - - 4

The committee could not find a fourth crop worthy of a premium.

Carrots. For the best ¼ acre, estimated at 300 bushels per acre, to Edson Sexton, of Stockbridge, - - $3 00
2d best to Wm. Williams, of West Stockbridge, - 2 00

GEORGE S. WILLIS, *Chairman.*

Working Oxen and Steers.

It is truly said, the ox knoweth his owner; and it is equally true, that no animal has sympathized more with man, or rendered him more assistance in the cultivation of the soil, than the ox. His teachable disposition, his healthy constitution, his early maturity to labor, the profits of his labor during his growth, the cheapness and the simplicity of the fixtures with which he is attached to the plough or the cart, his value for food after having acted well his part, are important items in agricultural economy, and prove that the ox is ever deserving that regard, "the righteous man hath for the life of his beast."

The whole number of entries were 31;—6 yokes of working oxen, 12 yokes of four-years-old oxen, 9 yokes of three-years-old steers, and 4 yokes of two-years-old. The committee were highly gratified with such a display of well disciplined oxen and steers. Could they have fulfilled their trust by an irresponsible examination, and by pronouncing them all good, their labor would have been pleasant. But when they felt the demand for close, good judgment, when they saw twenty-five anxious competitors, with but eighteen premiums to award, they found themselves in circumstances peculiarly embarrassing—not because there was no remedy, but because members of the society neglect to apply the remedy.

DANIEL D. KENDALL, *Chairman.*

Cows and Heifers.

The committee to whom was assigned the difficult and laborious task of examining and deciding upon the comparative merits of between forty and fifty cows, and half as many younger animals, report,—that although they make no pretensions to the experience or discrimination of M. F. Guenon, they, as good farmers are always wont to do, have endeavored to act, in all cases, with fidelity and impartiality in awarding their premiums. A large number of fine animals were exhibited; yet it was evident that, in most cases, the improved breeds of Durham and Ayrshire deserved the preference, both as breeders and milkers.

We would remind our brother farmers, that there is yet among us quite too much negligence, in the selection of breeding cows, and calves for raising. Hundreds of calves are raised in our county, that should have been recommended to the tender mercies of the butcher; and scores feel the edge of his knife, that should be rescued by the gentler hand of the grazier.

LYMAN FOOTE, *Chairman.*

Ploughing Match.

The plough is the instrument of peace. It is the instrument whereby peace wins her victories. Wheresoever civilization waves her banner, the motto thereon is, "Speed the plough." Wheresoever humanity arrays her votaries, she singles out the ploughman with his plough, as entitled to the foremost place. The genius of each season pays willing honors to the plough. Spring, as she steps over our plains and goes down our valleys, leaving her robe upon orchard and woodland, and giving the incense of her breath to the gale, departs not until she reminds the husbandman that Fortune, if he would win her favors, must be wooed at the plough. And Summer, while she adorns her arbor with flowers, and regales us with delicious fruits, points to the plough as being, under Providence, the producing power.

And sober Autumn, urging the sweating reaper to take from his tillage the yellow sheaf, the golden pumpkin, the ripened corn, and prepare for the "day of thanksgiving," claims from *all* fresh plaudits for the plough. Nor doth Winter, with his winds, and storms, and snows, withhold homage from the plough. While the "ruler of the inverted year" sends his blasts over our hills, the citizen, amidst the luxuries of his mansion, and the rustic, surrounded by the comforts of a happy home, partake of the treasured bounties of the year, secured under the auspices of the plough. Spring, Summer, Autumn, Winter, as they succeed each other in the cycle of months, send forth a chorus of blessings upon the labor of the plough.

The plough is an appropriate symbol of progress. When the world shall succeed in bringing to completeness, means for man's freedom and happiness, swords will be beaten into ploughshares, and the ploughshare will not be an unapt emblem of that great moral triumph. Not unapt is it, as a symbol of that sympathy which nations at times, when the famine is sore in the lands, are constrained to call forth from sister-nations. Of this, the passing year has given impressive illustration. While our mariners, and artisans, and merchants, have opened wide the palm of charity, and deserve the meed of praise, long, long may the harp of Ireland ring forth its symphonies in grateful tribute to the American ploughman. Ireland uplifted her famished hands, and her sunken eyes looked imploringly across the waters. Her woes touched the heart of the American husbandman, and he brought forth from his garners, the product of his rich furrows, and filled her hands with bread, and caused her eyes to rekindle with the radiance of life. Lo!

> "Peace hath her victories
> No less renowned than war."

A new age of chivalry has arisen. Such scenes as those represented at Ashby-de-la-Zouche, in the days of Cedric, the Saxon, are indeed passed away. Better fields are substituted—the field for the ploughing match. The chivalrous days of Ivanhoe, and of Richard the Lion-hearted, are indeed gone; better days of chivalry are come. The valor of knights, in coats of

steel, is indeed not exhibited in barbarous trials of skill; but the strong-armed yeoman competes like valorously with his peers of the plough. Honor to the victors in the conflict! But the difference is this. The chivalry of the lance and the sword sends distress and death to the millions; the chivalry of the ploughshare sends to them plenty, and happiness, and life. To be sure, at the plough, our country finds her noblest defenders. It has been said that the whale-ship schools the mariner to that glorious prowess which he exhibits in conflict upon the decks of our navy. And so thought we to-day, as we saw our noble Berkshire boys contending for victory in the plough-field. We should like to see one of them turn his back to his country's foe, in the hour of danger! Such an event can never happen. Whenever liberty needs strong arms, and broad breasts, and stout hearts to defend her, she may find them here, at the plough.

We turn from speculations like these, (not entirely inappropriate, we trust,) to the tournament of the day. The number of competitors with ox-teams was eight; the number with horse-teams, eleven. The land ploughed by each team was one fourth of an acre. The work was all done skilfully and admirably, and we would that we had at command a premium for each competitor. We award as follows:—

For single Ox-Teams.

To Henry B. Brewster, Pittsfield, 39¾ minutes, 32 furrows, 1st premium, ... $7 00
To Asaph D. Foote, Pittsfield, 40⅓ minutes, 30 furrows, 2d premium, ... 6 00
To Zachariah Sears, Lenox, 40 minutes, 31 furrows, 3d premium, ... 5 00
To Elisha S. Tracy, Pittsfield, 36¼ minutes, 28 furrows, 4th premium, ... 4 00
To Peter Shearer, Pittsfield, 43 minutes, 31 furrows, 5th premium, ... 3 00
To Daniel Sprague, Pittsfield, 39 minutes, 30 furrows, 6th premium, ... 2 00

For Horse-Teams.

To Merritt Ives Wheeler, Gt. Barrington, 38½ minutes, 33 furrows, 1st premium, ... $7 00

To Seymour T. Coman, Pittsfield, 35 minutes, 30 furrows, 2d premium, ... 6 00

To Walter Richards, Lenox, 37 minutes, 33 furrows, 3d premium, ... 5 00

To Joseph K. Hewins, West Stockbridge, 41 minutes, 35 furrows, 4th premium, ... 4 00

To James Foote, Pittsfield, 39½ minutes, 32 furrows, 5th premium, ... 3 00

To William Bradley, Lanesborough, 36 minutes, 30 furrows, 6th premium, ... 2 00

The ploughs used by the above competitors, were the Worcester plough, Miller & Bonney's, and one designated the "Poughkeepsie plough."

INCREASE SUMNER, *Chairman.*

AGRICULTURAL IMPLEMENTS.

For a lot of ploughs manufactured by Messrs. Ruggles, Nourse & Mason, which, it appears to the Committee, embrace great and valuable improvements, and are well worthy the attention of every farmer, "who holds himself the plough, or drives," they award a premium of $3 00.

They also examined a plough manufactured by Nelson Tracy, of Pittsfield, the strength and structure of which show the maker to be thoroughly acquainted with his business. Also a lot of ploughs of good shape, solid work, and excellent finish, by Starbuck & Son, of Troy. They award to I. T. Grant, for his fanning mill, a premium of $3 00. To John Viner, of Pittsfield, for two scales manufactured by him, and of equal merit to the best, either for beautiful finish or accurate weight, a premium of $3 00.

Messrs. Willis presented a straw-cutter, of new construction,

which combines within itself too many advantages to be long out of the possession of every farmer who knows the benefit and economy of cut feed. They also exhibited two churns, of a new model. These churns do not exactly promise to *go alone*, but they come so near it, that the smallest child can work them.

Several sets of mail axles were exhibited, manufactured by L. Pomeroy & Sons. These axles are made of Ancram iron, with collars swedged from the solid bar. They combine the grand desideratum of great strength, with little weight, above any other axles that are manufactured in this country. The arm being ground so true to the box that no air can be admitted, and the oil being confined within the chambers so that it cannot leak, the axle necessarily runs with little friction, and without any noise. We understand they are coming into use in nearly all the carriage manufactories of the country.

GEORGE W. MEAD, *Chairman.*

Butter, Cheese, &c.

The Committee have never witnessed, in the exhibition hall of the society, finer specimens of butter and cheese. The quantity of each was abundant, and the quality was so delicious to the taste, that the Committee found great difficulty in ceasing to apply this test. The thrifty wives of the farmers of Berkshire are strenuously urged to continue, in years to come, the exhibition of such wholesome specimens of their skill and care. Ten lots of cheese were exhibited. Among other premiums, there were awarded—

For the best 100 lbs. of cheese, to Mrs. Frances Deming, Williamstown, ... $6 00

For the best 50 lbs. butter, to Mrs. James Phillips, Pittsfield, ... 6 00

For the best 100 lbs of maple sugar, to Asahel Sherman, Lanesborough, ... 3 00

For the best two bushels of timothy seed, to Edson Sexton, Stockbridge, ... 3 00

For the best specimen of winter apples, to William Williams, of Stockbridge, ... 3 00

The Committee wish to commend particularly the effort made by Ezekiel R. Colt, of Pittsfield, to cultivate the Carolina or sweet potato, in his northern garden.

He exhibited a handsome specimen of this delicious potato, raised from a few seed-slips from Charleston, S. C. The Committee do not consider him exactly a "northern man with southern principles," but they pronounce him emphatically a northern man with southern *potatoes*.

ROBERT R. BRIGGS, *Chairman.*

PLYMOUTH COUNTY AGRICULTURAL SOCIETY.

In the returns of the doings of this society, it is said, by its president, "our statements are never as full as we should desire, and often present no just views of the experiments made by the applicants. We have endeavored for years, without success, to obtain some accurate account of dairy processes, and the management of domestic animals. These omissions give the transactions of the society a very lean appearance. We hope, in continued endeavors, the evil will ultimately be overcome, and that there will be something more in our reports on these subjects, than best and next best."

From the reports and statements accompanying the same, the following selections are made.

On Improvements.

We celebrate the anniversary of our association, at the close of another very abundant season of vegetation. Fruitful seasons are occasions of congratulation, and present numerous subjects of devout and thankful acknowledgment to the Great Author of blessings. The fruitfulness of the past season should cause something more than ordinary emotions. The spring opened upon us, amid numerous fears and gloomy prospects. We heard the piercing cry of want and wasting famine from Europe. While our hands were open to arrest the pains of starving multitudes there, we were painfully afraid that the unusual exportation of bread-stuffs might reduce portions of our own citizens to serious difficulties, and some want, even in the midst of plenty.

This fear was not without some just foundation. The constantly varying and occasionally extreme prices of grain and flour, have interrupted the usually sound calculations of many mechanics and farmers on a small scale, and obliged them to take, for immediate consumption, means which they had provided for the improvement and extension of their business. The occurrences of the year admonish loudly of the folly and danger of all unnecessary dependence on other states, for the essential articles of subsistence. This admonition seems to have been, to some extent, regarded by the farmers; Indian corn was fortunately planted the last spring more extensively than usual; it will give more than an ordinary crop. This success should induce associations to give increasingly liberal encouragement to the cultivation of this very important grain. Rugged as our soils are, and variable as our climate is, Indian corn can be raised here for less than the lowest price it is sold for, when imported from other states. We have better assurances of success with this, than any other grains which we raise. There has been nothing like a failure in this crop, oftener than once in twenty years, since the settlement of the country. We are not informed, that there ever was an entire failure: the nearest approach to it of which we have any knowledge, was in the year 1816; yet many careful farmers saved enough imperfectly ripened corn in that year, for the use of their families and domestic animals. We can perform no better service for the farming community, than in the adoption of effective measures to dispel prejudices on this subject, and engage farmers with renewed zeal, in the culture of an article which has been so justly styled, "the king of crops in New England."

The policy of this society, from the beginning, has been to encourage, in offers of liberal premiums, the conversion of useless lands into productive fields. We have large tracts in the county, so thickly covered with bushes, that little nutritive herbage for animals can grow there. Attention has been called to this description of land, and some labors have been judiciously applied to it. But we have made the premiums offered too soon available. The applicants have labored diligently, but not long enough, to subdue the roots of all the bushes. In passing over

grounds on which premiums have been paid, the supervisor has perceived small squads of the enemy fought there, again showing their heads; and, without early attention, they may soon rise in destructive force. Three years of careful cultivation, in some situations, becomes necessary to subdue effectually the bushes, and it will probably be advisable in future to require this. Paul Hathaway, of Middleborough, the only applicant this year for subduing bushes, has operated on a piece of land, thickly covered with bushes, and the work rendered tedious by numerous rocks. The committee recommend the award of the premium of $10.

Only two claimants, for the renovation of swamp land, have completed their experiments. Josiah Whitman, of East Bridgewater, has renovated about an acre and a half, which was covered with bushes and brakes, and yielded very little as pasturage. He ploughed, dug out the roots of bushes, levelled the surface, applied ten cords of compost manure, and seeded with rye, herdsgrass and red-top. The rye gave only a small crop; in some years it would have entirely failed; the soil is manifestly too moist and tenacious for this crop; with liberal manuring, it will produce grass in abundance. We suppose it is a common error, with farmers, to seed too scantily with grass. Mr. W. has certainly avoided this error, and we think has entered on the opposite extreme. One bushel of herdsgrass, two of red-top, and four pounds of clover seed, applied to an acre and sixty-three rods of land, we believe extravagant seeding, and unnecessarily expensive, if no other evil attends it. But another evil is likely to follow; when the grass-plants are too numerous, they will grow slender, and often before maturity fall in a mat on the surface, and a rapid process of decay will commence at the roots. The second premium offered for the renovation of swamp land, $10, is awarded to Mr. Whitman.

William T. Adams, of Bridgewater, has renovated, in a very effectual manner, a swamp remarkable for its roughness. It was indeed a formidable undertaking to subdue the bushes, and remove the rocks. Numbers of our young men would, rather than have engaged in such a work, risked their lives in a Mexican war, and vomito climate. Mr. Adams preferred contending

with the roughness of his native soil, and subduing the enemies of his interest at home, to the pursuit of glory in distant regions. He has fought manfully, and conquered an honorable peace, without loss of life or limb. As he proceeded, every post gained was so well secured, there was little danger of sudden attacks of Camanches or guerillas. Mr. A. has gained territory, which he can easily keep in a productive state, without making a chattel of any human being. There has been a failure in the transmission of Mr. A.'s statements. The committee, on the representation of the supervisor, and in the confident expectation that a statement will be forwarded seasonably for publication, recommend a gratuity of $14.

Mr. Adams is also a claimant for compost manure. From a view of his several heaps in September, there seemed no room for reasonable doubt of his meriting the first premium offered for that object; a gratuity of $9 is recommended.

George W. Wood, of Middleborough, the other claimant for manure, had composted a less quantity, and failed, on account of the weather, to measure something more than half of what he made. It is recommended, that to him a gratuity of $6 be paid.

Competitors for the premiums on compost manure, and on objects of permanent improvements, are not as numerous as we could wish. Whether the terms of the offers, or the amount of labor required, discourage applications, is a question which we will not attempt to solve. We know the prescribed terms are often subjects of criticism. In the opinion of some, we allow an unreasonable time for the completion of an experiment; others think the premiums too small to call forth much exertion. This would certainly be a valid objection, if applicants received no other reward for their labors. But, it is our purpose to present a scheme which will secure to every applicant an ample reward in his field, if he should fail of obtaining any thing from the society.

Often it is said we pay too much money for experiments that command very little of general attention, and, to great extent, neglect numerous objects which might make our exhibitions far more attractive. Articles of manufacture and fancy, implements of husbandry, fruits and vegetables, would be presented,

it is supposed, in greater and more beautiful variety, if more ample encouragement were given. It is obviously impossible to frame any system which will be accordant with the views and interests of each individual. The leading object of an agricultural society manifestly should be the preparation of fields for the production of choice fruits and vegetables. For the exhibition of such articles, we should rejoice to pay more money, if it were in our power to do so without any neglect of the foundations of their production.

We have seen with great satisfaction the origin of a Horticultural Society in the county, and hope it will ere long be possessed of funds sufficient to encourage the exhibition of all choice products.

MORRILL ALLEN.

Paul Hathaway's Statement.

The bush pasture that I have entered for premium I purchased in the year 1802; the former owner had repeatedly cut the bushes, and I followed his example forty years. The bushes were alder, black and swamp whortleberry, with some laurel. In 1842, I put in the plough with six oxen and a horse, subdued three acres, for which I have received a premium. In the year 1845, I ploughed one other piece containing three acres and 102 rods; in 1846, cross-ploughed the same; being very rocky, it was but partly subdued. Then with iron bars and hoes, removed the rocks, dug up the bushes, and seeded it with grass-seed at the expense of nine days work to the acre. Isaac Pratt had the stone; he called them 300 tons. When I commenced cutting the bushes, it was with the expectation of destroying them, but I was sadly mistaken. The few spots of grass gradually disappeared until there was only a small portion amongst the bushes of what we call neck or white oak grass. The tops of the bushes I could keep down, but a root I could not destroy.

Middleborough, Sept. 29, 1847.

Josiah Whitman's Statement.

The piece of land for which I have put in a claim to the premium, offered for the largest quantity of land which should be in the best state of preparation for English mowing, September 1, 1847, which was fresh meadow or swamp land June 1, 1846, may be called meadow pasture and brush swamp; the soil, from six to nine inches, resting on a hard clayey sub-soil, partially covered with brakes and blue whortleberry and laurel bushes. I commenced in August, 1846, and dug up the bushes, and mowed the brakes; the 15th of August, put in the plough with a strong team and three men; ploughed, rolled and harrowed; dug out brake-roots, carted on and spread ten cords of compost manure. Sept. 1, sowed to rye and grass, one bushel of rye, one of herdsgrass, two of red-top, and four pounds of clover seed—and laid open two ditches to let off the water.

It cost, for digging brush and mowing brakes, $6; ploughing, rolling, harrowing, and carting manure, $14; grass-seed, $4 40; rye, 84 cts.; ten cords manure, $30. Total, $55 24. Cost per acre, 41 dollars. I have taken from the piece this year ten bushels rye, and as good as one ton English hay,—say, after subtracting the expense of harvesting, $15 00. The piece contains 1 acre 63 rods.

East Bridgewater, Aug. 28, 1847.

William H. Adams's Statement.

The first piece of swamp land that I brought into English mowing was covered with stumps and stones, together with bushes and wild grass. It was mostly subdued with a narrow hoe, it being difficult to plough. I drained it by digging between 30 and 40 rods of ditches; it was in a very rough state when I commenced upon it. I sowed it down to herdsgrass on or about the 20th Sept., 1845; there were 72 rods in the lot. By good judges, it was estimated that, of the first and second crop, there were three tons to the acre.

I commenced, the present year, on an adjoining lot; this land is low and very wet. I had it cleared of stone and brush, having good ditches dug to let off the water; sowed it down 16th Sept. This piece contains 128 rods. Have put on it a heavy coat of manure; the seed has taken well. It being considered rather late for sowing, it remains to be seen whether it will do as well as if sowed earlier.

Bridgewater, Oct. 12, 1847.

George W. Wood's Statement.

The manner in which I made my compost manure is as follows:—In the fall of 1846, I carted into my yards muck, soil, clearing out of ditches, &c. of about equal parts. I then covered it with what potato-tops grew on about one acre, also about one ton of poor fresh hay, which made a good bed for my cattle to lie on. I also fed out in winter fresh hay, straw, corn-fodder, &c.; kept my stock in my yards in the day-time in winter, and at night in summer. In June, 1847, I began ploughing my yards over; ploughed and harrowed them once every two or three weeks. I also carted to my barn, piles of muck, and covered the manure I threw out from my stock daily, when it was not frozen too hard. Early in the spring of 1847, I dug and piled up what I had made in the winter. I made between 40 and 50 loads in that manner. I have no barn cellar, but have dug out from under my floors so that I can cart in, say ten loads, that preserves the urine of my stock. I cart in muck where I keep my sheep yarded in winter, and make about 20 loads of manure in that manner. I have carted out and applied to my land 179 loads, equal to 40 cubic feet each. Owing to the repeated rains, I have not carted out near all my manure; it has been all mud. My land is moist, and I think it would cut up so much that I should lose more than I should gain, by carting it out by the time required by the Society. I should think I had 150 loads now to get out.

Middleborough, Oct. 4, 1847.

William H. Adams's Statement.

In the course of the present year, I have carried out 401 loads of manure, or 83 cords 117 feet. I have used the soil from high ground, that being the best adapted to my land, not putting more than two loads of soil to one of manure. I have mixed in soil often in the course of the year. I have continued, through the season, to throw the manure that is made from my cows into heaps, believing this a better way than to let it lie spread about the yard. Where I have kept my horses, I have used straw and meadow hay for bedding, which makes good manure when rotted. Owing to the heavy rains, I have not got out more than two thirds of my manure.

Bridgewater, Oct. 12, 1847.

STOCK.

There were eight milch cows entered for premium; nine heifers having had calves, and nine not having had calves; eight bulls over one year old; four bulls and eight heifer calves, from which we select and award the following premiums:—

To Simeon W. Leonard, Bridgewater, best milch cow, $8 00—having given 292¼ lbs. in ten days in the month of June, which made 14 lbs. 12 oz. butter—ten days in September 218½ lbs. which made 11 lbs. butter.

To Sidney Packard, East Bridgewater, 2d best do. $6 00—having given 336 lbs. in ten days in June, which made 12¾ lbs. butter—ten days in Sept. 245 lbs. which made 9½ lbs.

To Josiah Whitman, East Bridgewater, 3d best do. $4 00—having given 273 lbs. 6 oz. in ten days in June, which made 14 lbs. butter—ten days in Sept. 215 lbs. which made 11 lbs. 10 oz.

To Abigail Whitman, E. Bridgewater, for the best heifer having had a calf, $6 00—having given 195 lbs. of milk in ten days in June, which made 10 lbs. butter.

To S. S. Lovell, Bridgewater, 2d best do. do. $4 00—having given 207 lbs. in ten days in June, which made 9¼ lbs. butter—ten days in Sept. 147 lbs. which made 10½ lbs.

JOHN TILDEN, *Chairman.*

Ploughing Match.

The ploughing match has ever been considered the most exciting and most interesting part of our annual exhibition; and, at former exhibitions, all have been allowed the privilege of witnessing the operations, whose inclination led them to the field. Not so to-day; your committee have been deprived of this pleasure, and for what reasons, they have not been advised, but left to conjecture. Your committee was directed to a piece of land, by one of the committee of arrangements, in whom we place much confidence, for through him, and by him, was our only source of information. Your committee have no personal knowledge, whether the land presented to them for examination was ploughed, to-day, by competitors, or yesterday, by experimenters; and regret that they could not have been an eye-witness to a piece of work, of which they are to be the final judges. But, as our course was marked out, in which we were to tread, we could not follow the footsteps of our predecessors, and, having no disposition to take the responsibility, we know not whether to congratulate the society, or sympathize with them in the prospect before them.

Twenty teams were entered for premiums, and eighteen were present and ploughed. Where twenty teams are entered for seven premiums, and all plough well, it is not an easy task for a committee to say who has ploughed best of all. But your committee have the pleasure of saying, although much we may have erred in judgment, we have been unanimous in our opinions, and award premiums to the following persons:—

Van R. Swift,	1st	$9 00	Prouty & Co's.
Newton Mitchell,	2d	8 00	Ruggles & Co's.
Mark P. Hudson,	3d	7 00	" "

Daniel Alden,	4th	$6 00	Prouty & Co's.
William Dunbar,	5th	5 00	Ruggles & Co's.
Abram Washburn 2d,	6th	4 00	" "
Darius Dunbar,	7th	3 00	Prouty & Co's.

To Willard Wood, Horace Ames, and Philo Mitchell, 1 Vol. each of the Mass. Ploughman; Nahum Tribou, Ira Conant, $1 00—(drove his team) George H. Wood, 1 do. do. Boston Cultivator.

Your committee think that more depends on the skill and ingenuity of ploughmen, to accomplish good work, than does a preference to the plough used.

Your committee regret that, from so large a number who belong to this society, a committee could not have been, or was not selected, in whom the utmost confidence could be placed; and hope the society will be fortunate enough, in the selection of their committee in future, to select those whose honesty will not be doubted; for we do not believe that this new mode of disciplining committees, will have a beneficial result. If former committees have been suspected of mingling favor with their awards, your chairman regrets that he has been retained so long, and so often called to serve on a committee of so much importance, and shall be disappointed, if not released from further services.

AURORA W. OLDHAM, *Chairman.*

Supervisor's Report.

Objections are made against premiums for the greatest crops on single acres, as tending to discourage, rather than improve, general cultivation. There may be instances, in which some individuals confine their whole attention to some favorite fields; but we suppose this is not the usual result of extraordinary preparations for large crops. The evidences of what can be accomplished, in attentions to a particular field, will be likely to stimulate increased attention to the whole farm. When valuable crops, as sometimes happens, sink into disrepute, there is no

more effectual means of raising the reputation of them, than offers of reward for the greatest products. This has been very clearly proved in the offers we have made for the greatest crops of Indian corn. This article, it was extensively supposed years ago, was too expensive to justify an extended cultivation. Several towns in the county, where it had formerly been raised to some extent for the market, had so far neglected it, as to become purchasers of nearly or quite half the quantity used. The prevalent opinion, in the county, twenty years ago, was, that Indian corn could not be raised for less than one dollar per bushel. Now, the estimates of expense seldom exceed fifty cents, and often fall considerably below that sum. The cultivation of some other crops has been improved in nearly the same proportion.

In offers for the largest crops, we encourage experiments in different methods of ploughing, with respect to season and depth, of composting and applying manure, of planting and the subsequent cultivation of the plants. The result is a perceptible yearly improvement, not only in the fields of competitors, but generally through the county.

We can give another answer, which ought to silence objections against holding out encouragement for the greatest crops. In the observations made in a period of thirty years, no instance has fallen under our notice, where personal interest has not been advanced in careful preparation for great crops. It has become a proverbial saying, among competitors, if the society give no premium, the field will.

Nathan Whitman, of East Bridgewater, entered a claim for the best crop of Spring wheat. He obtained something more than the required quantity, and is entitled to the first premium, $15. Mr. W. supposes he should have had several bushels more of wheat, had it not been so badly lodged by a gust of wind in July. The small grains are always exposed to injury from strong winds, and the danger is often greatly increased by the imprudence of the cultivators. Mr. W. applied manure to his land near the time of sowing, the tendency of which was to produce too rapid early growth, and too much weakness of fibre, to regain the natural position after any disorder. Had the value of the manure applied the last spring, or even the one half of

that amount, been expended in pulverizing the soil, we believe his crop would have been heavier, more evenly ripened, and therefore threshed cleaner. One leading cause of so many failures in attempts to raise wheat, we think, may be neglect of working the land sufficiently. In fields newly cleared from the forest, the soil is always porous, and those fields yield abundantly. Continual cropping produces compactness in the soil; therefore, in preparing an old field for wheat, we should reduce it, as near as practicable, to the state of forest soil. No manure need be admitted into the process in a field which produced, the preceding year, as did Mr. W's., more than a hundred bushels of Indian corn to the acre.

Six claims were entered for the best crop of Indian corn on an acre of land. One was withdrawn because the field, supposed to contain an acre, proved less in measurement. It is due to that applicant, Mr. Drake, the superintendent of East Bridgewater Almshouse, to state that, according to appearance from the road, he had one of the largest crops noticed in the county. Another claim was withdrawn late in the season, on account of injury to the crop from a great rain.

Four fields were examined, and the product of one square rod in each, weighed, with the following results:—In the field of Nathan Whitman, of East Bridgewater, the product of a rod weighed 49½ lbs., making 105$\frac{45}{75}$ bushels to the acre; in that of Paul Hathaway, of Middleborough, 42 lbs. making 89$\frac{15}{75}$ bushels to the acre; George W. Wood, of Middleborough, 41¾ lbs., making 89$\frac{5}{75}$ bushels to the acre; Dexter Pratt, of East Bridgewater, 37 lbs., making 78$\frac{70}{75}$ bushels to the acre.

Messrs. W. and H. cultivated their corn chiefly with horses. Mr. W. hoed not at all, and spent less than twenty hours in pulling up weeds. In this instance the success of the course has been entirely satisfactory, but a reasonable doubt may be entertained whether it should be recommended in general practice. In smooth fields, free of perennial weeds and stones, the hoe may be dispensed with; but, in fields filled with the roots of what is called dog-grass, as many now are, every available instrument seems important in eradicating them. Mr. H., two years in succession, has obtained very fine crops of corn, with very little

use of the hoe. As far as farmers can cultivate to advantage with the horse, they should certainly adopt this course, as they will be able to till more extensive fields, and do it with less expense, than they possibly could with what is termed hand-labor.

We are sorry to have occasion to complain of deficiencies in the statements made. There seems to be no difficulty in writing out a true account of what has been done, and how accomplished. Yet it is seldom that we have any thing like a full account. In estimating the expense of an operation, it is rare that every item which should have been taken into the account is mentioned. The statements of the corn crops are all of them, this year, deficient on a point specifically required on the list of premiums. None of them inform us how their seed-corn was selected and preserved. One of them states that he had it of a person in a neighboring town, and that it was selected specially for seed; but whether in the field, at the time of husking, or in the crib, we know not. This is a subject of more importance than competitors, ardent in the pursuit of premiums, may think it. We have a very variable climate, and late corn is frequently injured by early frosts. In a careful selection of the first-ripened ears for seed, we secure the maturity of the crop a week or two earlier than in a promiscuous selection of it. Taking all our seed from the most fruitful stalks, we employ one probable and proper means of increasing the crop.

First premium on corn is awarded to N. Whitman,				$8 00
Second	do.	do.	to P. Hathaway,	6 00
A gratuity	do.	do.	to G. W. Wood,	4 00
do.	do.	do.	to D. Pratt,	2 00

Daniel Alden, of Middleborough, is entitled to the first premium for oats, $8 00, having raised 69½ bushels on one acre and nine rods. Mr. A. has again been very successful with oats in the use of a less quantity of seed than is usually employed. There were, however, some other circumstances which might have affected his crop favorably. He applied a quantity of salt to his field two years in succession. The influences of this article on the grain crop are not yet very clearly ascertained. He also applied some wood-ashes, a very good vermifuge and

powerful stimulant to almost every kind of plant. Farmers, we think, will do wisely in making trials with less quantities of seed oats, especially where they seed also with grass. It is uncommon to see so vigorous-looking young grass where oats had grown, as appears in Mr. A's. field.

Thomas Weston is entitled to the first premium on white beans, $6 00.

Orsamus Litteljohn is entitled to the premium for carrots on quarter of an acre, $5, having raised 102½ bushels.

Five claims were entered for French turnips. From various causes the turnips were very uneven ; some of the applicants had supplied the vacant spaces with round turnips. The supervisor stated to the committee that the weight of a selected rod on most of the plats was a very uncertain criterion by which to judge of the whole product, and would operate very unequally among the applicants, as some of the soils were of a very adhesive character, and the turnips could not easily be freed from a quantity of earth. For these reasons, gratuities are recommended.

G. W. Wood is entitled to the first premium for the greatest crop of potatoes on an acre, having raised 457 bushels, according to the rod weighed, $8. Mr. W. obtained a sufficiently large crop, and should receive the premium : he has not much prospect of benefit beyond it. The potatoes were, a large portion of them, discolored on the outside, and will probably decay, if stored in a cellar. Whether they are of much value as food for animals, in a decaying state, seems very doubtful. It will not be wise, under existing circumstances, to encourage extensive planting of the article. Notwithstanding the numerous dissertations written on the subject of this malady, and the various remedial projects that have been adopted, we remain nearly as ignorant of the causes and cure as when the difficulty first occurred. Early after its appearance in this country, a very distinguished agriculturalist, in a discussion on the subject, said he could describe it only as a certain physician once characterized the disease called spotted fever ;—it is death. We know, to our loss, the fatal character of the malady, and our knowledge extends very little farther. In the progress of the

disease, we discover that some kinds of potatoes decay more than others, and that there is more of the disease in low and moist, than on high and dry land. Perhaps observation and experience will prove the most reliable sources of knowledge we shall ever attain in the case. Within the memory of some of us, there was almost universal despair in relation to the rye crop; blight seemed to pervade every field where it was sowed. Now, in the careful selection of soils, in attention to the preparation of them and the time of seeding, farmers sow rye with good hope of success. We hope that observation and experience may prove effective in annually diminishing the losses now sustained in the potato crop.

For Committee on Produce,

MORRILL ALLEN.

Nathan Whitman's Statement.

The acre of wheat from which I harvested 20 bushels and 23 quarts was land planted to corn in 1846. May 7th, 1847, ploughed the same, and spread on 20 loads of compost manure, and ploughed in the same with a horse plough. Then I sowed one and a half bushels of Black Sea wheat, which I bought in Boston, without soaking. I harrowed it in well, then sowed on $\frac{1}{2}$ bushel herdsgrass seed, with eight pounds of clover; after which I rolled it with a roller, the diameter two feet, which I think much better than those built 3 or $3\frac{1}{2}$ feet diameter. This wheat was sowed the 12th of May. The first of July, there was a gust of wind that blowed it down, and about $\frac{1}{16}$ of it never righted, and did not fill; and, in harvesting, I mowed instead of reaping, which prevented threshing it clean. Some good judges think $\frac{1}{6}$ of the wheat still remains in the straw. That part which was not blown down, was filled exceedingly well, and I think this kind of wheat may be raised as well as any other grain.

East Bridgewater, October, 1847.

Nathan Whitman's Statement.

The acre of land on which the supervisor selected one rod, and harvested 49½ lbs. of corn, making 105 $\frac{4}{7}\frac{5}{5}$ bushels per acre, was sward-land in May 1846, and was ploughed and planted to corn, but failed in coming up; therefore I expected but a small crop this year. May 15th, ploughed the same depth, 7 inches, then put on and spread 40 loads of compost manure, and ploughed it in with a horse plough; then planted it in drills 3½ feet apart, dropping the corn 6 inches apart; finished planting the 20th. The 1st of July, went through with cultivator twice in each row; then I took a piece of scythe, turned the end about five inches, and went through and cut up all the remaining weeds. The middle of August, went through with cultivator, as before, and pulled up what few weeds remained with my hands. I have spent but 15 hours time from planting until harvesting, besides the cultivating.

Expense: ploughing and spreading manure, $3 00; manure, 40 loads, and carting the same, $40 00; planting and seed-corn, $4 00; cultivating and weeding, $3 50; harvesting, $4 00; use of land, $4 00; Total, $58 50.

Credit: corn, 105 $\frac{4}{7}\frac{5}{5}$ bushels, $105 60, corn-fodder worth $8 00, land improved by extra manure, $15 00. Total, $128 60.

East Bridgwater, Oct. 1847.

Paul Hathaway's Statement.

The land upon which my corn grew, entered for premium, was rather low and springy. I could not plant it until May 20th and 21st. Corn, white, which I had of Mr. Gushee, in Raynham. Name not known, but selected particularly for seed. Two acres planted in this field, ploughed in August and September, spread thirty ox-loads of compost manure, and harrowed it in. Last May, upon the two acres, spread fifty-eight loads, and ploughed with a light furrow, then harrowed and

furrowed. Hills three feet each way, and planted as above. At weeding-time, with a horse-harrow, went twice in the row, both ways. Any weeds in the hill were removed, and corn thinned to four plants. Second time, harrowed once each way, and removed the weeds from the hills. Third, sixteen pounds of clover, one bushel of herdsgrass, and two pecks red-top seed. Harrowed once each way in the row. In September, cut the stalks, not for the good of the corn, but to let the sun in upon the young grass.

Middleborough, October 27, 1847.

George W. Wood's Statement.

The land I entered for premium, 1847, for the greatest crop of Indian corn, was a clayey loam. It was English meadow in 1846, and cut about three fourths of a ton to the acre. The expenses for raising my crop of corn were as follows: May 1 to 19, ploughing ground, $2 50; harrowing, 50 cents; getting out and spreading 30 loads of compost manure, $3 50; cultivating in manure, 75 cents; furrowing, 50 cents; two men and boy two days, planting, $5 00; ten quarts seed corn, 40 cents. Made the rows one way so as to average five rows to the rod, the other way, eighteen inches apart. Put half a pint of leached ashes in a hill; mixed the same with the soil before dropping the corn; put three corns in a hill. June 11th, cultivating the corn, 75 cents. June 17, cultivating once in a row, 38 cents; two men and boy one day, hoeing, $2 50. June 29, cultivating once in a row, 38 cents. July 3, two men and boy one day, hoeing, $2 50; cultivating, 38 cents. July 31, cutting up weeds, &c., 50 cents. I did not cut more than one quarter of the stalks. I find the corn sounder and riper where the stalks were not cut. October 18, the supervisor came and harvested one rod, which weighed 41 $\frac{3}{4}$ pounds, making 89 $\frac{5}{75}$ bushels to the acre.

I have not harvested but a small part of the corn yet. For that reason, cannot state the cost of harvesting, but I think the

fodder will be worth two dollars more than the expense of harvesting and other trouble about it. Whole expense for planting, hoeing, &c., $20 64; 30 loads compost manure, $15 00; 60 bushels of ashes, $6 00; carting, $1 00; use of land, $6 00. Total, $48 64. Deduct, for benefit of manure to the land for the next crops, one third the cost, $7 33; corn fodder, $2 00. Total, $9 33; making the corn to cost me within a fraction of 44 cents to the bushel.

Middleborough, Oct. 23, 1847.

Daniel Alden's Statement.

The land on which I raised the crop of oats, entered for premium, is a sandy loam; in 1845, it was grass; in October of that year, it was ploughed; in the spring of 1846, carted on 30 loads of compost manure, and sowed three bushels of salt; cross-ploughed with a light furrow, not disturbing the sod, and planted to corn; likewise put on 15 bushels of ashes around the corn. Last April, ploughed the ground, and, on the 22d, sowed two and a half bushels of oats to the acre, after soaking them and rolling them in ashes. I also sowed on three bushels of salt, and put the oats in with a cultivator, sowed grass-seed, and rolled the field. I had 69½ bushels on one acre and nine rods, as stated above, weighing twenty-nine pounds per bushel.

To oats, 2½ bushels, $1 25; 3 bushels of salt, $1 50; ploughing, $1 50; cultivating and harrowing, $1 50; sowing grain and salt, 50 cents; cutting oats, 75 cents; threshing and cleaning up oats, $4 25; raking, binding and carting, $1 75. Total, $13 00.

By 1½ ton straw, at $6 per ton, $9 00; 69½ bushels of oats, at 50 cents per bushel, $34 75. Total, $43 75.

N. Middleborough, Oct. 8, 1847.

Thomas Weston's Statement.

The half acre on which I had white beans, was planted to corn last year. On the 20th and 21st of April last, I ploughed the ground 6 or 7 inches deep. June 10th, carted on 7 loads of compost manure; 11th, spread the manure, and ploughed it in with a small plough, very shoal, and furrowed the ground one way; June 16th and 17th, planted the beans in hills, three feet (scant) by one and a half feet apart. Put in 22 quarts of seed. July 8th, hoed them, without ploughing, and left the ground level. August 9th, pulled up the weeds. October 16th and 18th, pulled and threshed them, and there were eight bushels.

Expenses; ploughing the ground, $1 00; drawing and spreading manure, $2 00; ploughing in manure and furrowing, 67 cents; planting, $1 17; hoeing, $1 50; pulling weeds, 42 cents; harvesting, $3 33; seed planted, $1 37. Total, $11 46.

Middleborough, Oct. 18, 1847.

Orsamus Litteljohn's Statement.

The one quarter acre entered by me for premium on carrots, was in carrots last year. Soil, sandy loam. April 27th, ploughing, 50 cents. April 30th, spreading, harrowing and bushing in 33 horse-loads of cheap compost, $1 50; ½ lb. seed, and sowing with machine, 67 cents. May 28th and 29th, weeding 1½ days, $1 12. June 8th and 9th, weeding 2 days, $1 50. 23d and 24th, weeding, 1¼ days, $1 00. July 14th, 2 hands one day, weeding, $1 50: 17th, weeding, half day, 38 cents. Cost, $8 17.

Middleborough, Oct. 16, 1847.

George W. Wood's Statement.

The land I entered for premium, for the greatest crop of potatoes, in 1847, was a loamy knoll, planted to potatoes and tur-

nips, in 1846. May 18th, to 23d, ploughing ground, $2 00; carting out and spreading 30 loads compost manure, $3 50; ploughing in manure, harrowing and furrowing, $2 00; three men and boy one day, planting, $3 50; dropping 1½ casks of plaster in the hills, $3 00; 23 bushels of potatoes, long reds, $11 50. June 16th, cultivating, 75 cents; two men and boy one day hoeing, $2 50. July 1st, cultivating, 75 cents; two men and boy one day, hoeing, $2 50; August 2d, cutting up weeds, 50 cents. Whole amount of labor, $18 00; one and a half casks of plaster, $3 00; 30 loads compost manure, made as follows: in the fall of 1846, carted to my barn a pile of muck; as I threw out the manure daily, I mixed the muck with it; kept it covered when it was not frozen too hard; early in the spring, dug it over and piled it up, about equal parts of muck and manure. The manure I called worth 75 cents per load, $22 50; chopping over and piling up manure, $1 25; use of land, $6 00; 23 bushels potatoes, at 50 cents, $11 50; Total, $62 25.

October 18th, the supervisor came and selected one rod of ground, dug and weighed the potatoes, 160 pounds, making 457 bushels 8–56 to the acre. I have not dug my potatoes, so I cannot include the cost of digging. The potatoes have cost, as they are in the ground, between 13 and 14 cents per bushel, which I think is as much as they are worth, as there are so many of them defective.

Middleborough, Oct. 23, 1847.

BRISTOL COUNTY AGRICULTURAL SOCIETY.

The annual Fair of this society, was held in Taunton, the 13th of October last. The day proved to be unfavorable for the attendance of people who lived at a distance, still there was a large company assembled. It is to be regretted that there are so few competitors for the premiums offered on field crops. It may be said, that those who raise the largest crops are men of wealth, who do not care to place themselves in competition with those of humbler means. But this should not be urged as an objection against sending such statements of what their land has done, as may interest and benefit the members of the society. The object of this, as well as of all similar societies, is to diffuse knowledge throughout the farming community; and, in order to bring this about, every man should be willing to tell what successful experiments he has made, that others may profit by his experience, and be incited to go and do likewise.

The address was delivered by J. H. W. Page, Esq., of New Bedford.

From the reports of committees, and statements, the following selections are made.

Breeding Stock.

There were entered for premium in this class, 9 bulls, one bull calf, 11 cows, 16 heifers, and 5 heifer calves. The animals were, generally, of a better description than those at the last two exhibitions of the society, but, owing to the inclemency of the weather, they were not shown to the best advantage.

The committee were much pleased to perceive this evidence of increased desire, on the part of farmers, to improve their stock. Some previous exhibitions of the society had been so inferior to what was anticipated, that there was some doubt if any beneficial results were produced by them. In one instance, an animal was exhibited, for which the only merit claimed, was, that it had survived the rigid treatment to which it had been subjected; at eighteen months old, the bull was about the size of an ordinary calf at six months. In many instances, the exhibitors have stated that they did not consider their animals extraordinary, but had entered them on the chance of there being nothing better to take the premiums.

It is desirable that the competition be as general, and bring together as great a number of the farmers of the county, as possible, to exhibit and compare their animals. Such a course would not fail to improve their judgment, and enable them to select such as will prove best adapted to their wants.

It is needless to discuss here the characteristics of a good cow, or the relative merits of the various improved breeds; both are generally well known. There are many excellent cows of the native stock, which yield a large quantity of milk of good quality. These animals are always readily purchased by those who are selecting stock for immediate profit—the breed being of little consequence to them; but the case is very different with those who rear them either for their own use, or for sale, as the good cows are of rather rare occurrence, and the poor ones must be sold at a very low rate, or retained to the great detriment of the owner.

It is of course desirable to obtain a stock in which the progeny will inherit the good qualities of the parents, and, in this predisposition to inherit, consists the only real title to the name of "breed." Almost every farmer who has owned a native cow of the first class, has desired and attempted to propagate the stock; and, if the committee may judge by the result of a number of these trials, which have come to their knowledge, the success is not such as to encourage the continuance of the practice. These failures may, doubtless, in many instances, be attributed to the inferiority of the bull. A probable cause is,

that the animal "takes back," as it is commonly termed; in other words, the cow herself is the accidental product of inferior stock, in which the good qualities are not sufficiently confirmed, to be propagated, otherwise than by chance.

What are called the improved breeds, are the results of constant care and attention of the breeder, to the particular characteristics of those animals which are best adapted for certain purposes, and by discarding, for breeding, all which do not possess the required qualities. When this policy has been pursued for some time, and the characters have been well preserved through several generations, they may be looked for, in the progeny, with considerable security; and even when breeds so established have been crossed with others, a person tolerably well acquainted with them, will easily recognize their peculiarities.

It is a common remark of farmers, that many native cows are equal to the improved breeds, and this position the committee will not attempt to controvert; but it must be admitted, that the animals referred to cannot be considered as a fair specimen of the stock. It must also be admitted as very desirable to obtain a breed, all of which will be equal to the best selections from the native. It is believed that, for this purpose, the well-known improved breeds may be introduced to great advantage; not that a single cow of superior quality may be produced, but with some degree of certainty, that but few will be very inferior.

After the introduction of such animals, it is only by great care and judgment in breeding, that all the peculiar attributes can be preserved in the highest degree. Every farmer will readily know when he is possessed of a good cow; but to have a good bull is equally important, and far more difficult to select. Even the most experienced may err; and the most unfortunate part of the failure, in this respect, is, that the discovery is too frequently made in the miserable character of the offspring. In England, the breeding of bulls is made a separate business, and only the best judges are engaged in it, and the farmers purchase approved animals of them. In this way, the good character of a breed is maintained.

It is probably owing, in a great measure, to ignorance in this

department, that many imported animals have produced a very unsatisfactory result; and also, the frequent practice of "in-and-in" breeding, under the mistaken idea that by so doing, "and keeping the breed pure," as it is termed, they are benefiting the stock.

There is also a great disregard to the care of young animals; they are frequently turned out in the open air during cold weather, and fed on the poorest food which will sustain life. An entirely contrary practice is enjoined and observed by the most successful breeders; their maxim is to get the young animals fat as early as possible, and keep them so until maturity. To produce this result, nothing is more important than shelter. If the vital heat is not partially maintained by sheds and barns, it must be made up by the extra quantity of food given to the animal, or else by consuming any fat which it had acquired during the milder season.

To be satisfactory, however, all information on these topics must be acquired by experience, and it is desirable, in making the trials, that several animals be taken and submitted to a certain treatment, and, at another time, to a different course, and not that one animal be tried in each way, as the mere difference in them may produce very uncertain results.

A. ROBESON, Jr., *Chairman.*

Butter, Cheese, and Honey.

There were twelve entries of butter, six of cheese, and two of honey. The quality and flavor of the butter were excellent, nearly all of which was accompanied by statements of the mode of making. The committee award as follows:—

To Harvey Claflin, of Attleborough,	1st	premium,	$6 00
" David Keith, Raynham,	2d	do.	5 00
" Eli K Washburn, do.	3d	do.	4 00
" Paddock Dean, Taunton,	4th	do.	3 00
" Jacob Dean, Mansfield,	5th	do.	2 00
" Leonard Hodges, Norton,	6th	do.	1 00

There were few samples of cheese offered for premium, and the committee regret to have evidence of a lack of interest or a laudable rivalry, on the part of the farmers' wives of Bristol County, to excel in this department of the dairy. They award for specimens of cheese,

To John Arnold, Jr., of Norton,	1st premium,	$5 00
" E. B. Dean, Raynham,	2d do.	4 00
" Jarvis Hodges, Norton,	3d do.	3 00

The samples of honey were delicious; and, as there were only two, there was not a very wide latitude for the committee in making a decision; and they award—

To Simeon Green, of Mansfield,	1st premium,	$4 00
" George Price, Attleborough,	2d do.	3 00

J. W. D. HALL, *Chairman.*

FRUITS.

The committee award—

To Jacob Dean,	for 87 varieties of apples,	$5 00
" David Arnold,	for 26 do. do.	4 00

They would speak in particular of a grape-vine and tomato-vine, in the garden of Charles Babbitt, of Taunton, for their rapid growth, and recommend his mode of treatment, pruning, &c., to the notice of cultivators, and award him a gratuity of one dollar.

Charles Babbitt's Statement.

On Grape Culture. In the Spring of 1845, I had a small vine called the "Woodson," a small, round, black, Virginia grape, from Prince Edward's County, which ripens later than most other varieties, but yields abundantly. I then removed it

from a northern to a southern aspect, in the rear of my shop; it was a single stalk two feet from the ground, then forming two branches, one seven, the other nine feet in length. I put up four pine-joists, 23 feet long, about 18 inches from my building, upon which I nailed strips of board 2½ inches wide and 18 feet long, two feet apart, across the joists; then nailed laths to these slats, upright, to which I fastened the vine, from time to time, as it grew.

The first season, the vine had eight or nine branches, from six to eight feet long, bearing six bunches of grapes that ripened. Late in the fall, I removed the earth from the top of the roots, and covered them with rotten horse-manure and earth, mixed. I also cut off all the branches within about four inches of the stock. In the summer of 1846, this vine threw out many branches, seventeen of which I selected for culture. These grew about 15 feet; and, finding them too near together, I cut off 6 more, leaving 11, which grew about 26 feet. I trimmed off all the little foxes or laterals, and trained the vine upward, securing it upon the laths, in a fan shape. On the 10th of October, I had 60 bunches of grapes ripened. In December, I cut off about six feet of the tops of the vine and fastened them to the top-slats of the frame. Summer of 1847, the vine threw out its branches from every bud, accompanied with fruit, 1st of July. When the grapes were fully set, I cut off every branch one joint above the fruit. The grapes grew rapidly to a full size; but, the month of September being unusually wet and cold, they did not ripen before the frost came. The vine was loaded with fruit, bearing 1068 bunches of grapes. During the summer months, the vine was watered once a week with soap-suds and saltpetre water, dilution, about 1 lb. to 4 gallons.

Tomatoes, Quince, and Plum Trees. On the 26th of February last, I planted, in a flower-pot in my shop, a few seeds of the pear-tomato. In May, I transplanted five of the plants in my garden, four of which I set out in a square of about ten feet, and, in the centre, another plant. To try the experiment, I inserted four bean-poles in the ground, about eighteen inches from the plant, spreading the tops outward, about eight feet square, and, after bracing them properly, nailed laths from the bottom

six inches apart. As the vine grew, it was, from time to time, secured to the laths with strips of matting, completely filling up the frame-work, and spreading each way to the height of eleven feet. I picked a bushel of ripe tomatoes, and, on the 26th of October, after the frost had arrested their growth by killing the vine, I picked nearly five pecks more of partially ripe and green tomatoes, from this one plant. I measured the vine, when it was removed—that is, all the branches over a foot long, (the main branches being 11 feet,) and it contained in all 797 feet, not including the parts cut off while growing. I watered the vine, when young, with soap-suds, and, when it began to bear, with a little saltpetre water, say about one lb. of saltpetre to four gallons of water, three or four times in the season. I gathered more good tomatoes from this vine than from all four of the others which ran upon the ground. Upon another experiment, I should not permit the vine to grow more than five feet, trimming off the ends, as I am satisfied that they will bear more abundantly, and ripen sooner, than with so much vine.

I have used nine gallons of saltpetre in my garden during the summer, around my plum and quince trees, gooseberry and currant bushes, and garden rhubarb, and have found it to be the best manure or fertilizer that I have ever used, producing a luxuriant growth, and larger and handsomer fruit. The experiment I tested upon my gooseberries proved that the fruit upon the bushes watered with the saltpetre dilution, was double the size of those where it was not applied.

In the spring, I selected the four smallest from eight hills of rhubarb, for an experiment. I applied the saltpetre water, two quarts each time, in May and June. From one of the hills I gathered a stock, the leaf of which measured 2 feet 3 inches wide, and 2 feet and 4 inches long; the stock was proportionally large. In the spring of 1845, I set out a small quince-bush. It grew well that and the following seasons, but bore no fruit. In May last, I applied a pailful of saltpetre water around the roots, and again, in June and July, repeated the quantity. The foliage soon became a dark and rich color, and grew fast; the body has almost doubled in size; and I gathered from it 40 large and very fair quinces. Four years ago last spring, a

neighbor set out two plum trees, (the purple Gage,) ten feet apart, in the garden adjoining mine. A year since, one of the trees came into my possession. This one had borne no fruit, but the other had, last season. In the spring, I rubbed the lower limbs and body of the former tree with soft soap, and spread and hoed in beneath it a pint and a half of salt: in May, I applied a pail of the saltpetre water. The leaves changed to a darker green and a larger size; new shoots started, and grew faster than upon the other tree. In June, July, and again in August, the same quantity of the dilution was applied. This tree hung full of fruit, which ripened well; while the other tree neither bore so full nor grew so fast; many plums fell off; the branches grew but six or eight inches; while the one upon which I tried the experiment threw out numerous branches very long, one measuring four feet eight inches. The body now girts $1\frac{3}{8}$ inches larger than the other tree; the bark is smoother, and the tree looks healthier.

Taunton, 1847.

Vegetable Crops.

The applications for premiums were few, and still fewer those accompanied by statements of the mode of cultivation, required by the regulations of the society. Unless there are minute details of the method and expense of raising a crop, by which the members of the society can judge of the profit derived from a particular branch of agriculture, the liberality of the Commonwealth, in providing means to reward the most successful cultivators, would be of little or no avail, as a matter of public utility. On this ground, it has become a settled rule with the Committee, to enforce, as far as practicable, the regulations adopted by the society, on this subject.

The Committee have awarded, for the best crop of beans, on not less than a quarter of an acre, to Andrew H. Hall, of Taunton, 1st premium, $5 00; for the best crop of English turnips, on not less than a quarter of an acre, to Jacob Dean, of Mansfield, 1st premium, $5 00.

B. RODMAN, *Chairman.*

Andrew H. Hall's Statement.

The following is a statement of the preparation of the ground, planting, hoeing, and harvesting, a piece for white beans, raised on a quarter of an acre of land. The land was planted to corn and potatoes, in 1845; had about thirty-one horse-loads of manure to an acre put on it; and yielded at the rate of 60 bushels of corn to the acre. April, 1846, six horse-loads of manure were drawn from the barn-yard, and spread on the quarter of an acre,

worth about	$3 00
In April, ploughed with 2 horses 1½ hours, . . .	45
May 20th, ploughed with 1 horse, 1 hour, . . .	20
May 25th, planted, man and boy ½ day	75
July 3d, hoed 1¼ days, $1 25,—24th, hoed ¾ day, 75 cts.	2 00
Sept. 3d, harvested beans, and laid them on the ground to dry; by a boy, one day, ...	50
Sept. 12th, carried to the barn, threshed, and winnowed, ¾ of a day, ...	75
Seed planted, 3½ pints, ...	10
	$7 75

They were planted 18 inches one way, 8 the other, and put one bean at a place. The whole crop measured 7 bushels, 1 peck, 5 quarts, and a pint, at $1 75 per bushel, $13 00.

Taunton, Dec. 21, 1846.

Jacob Dean's Statement.

The land on which my turnips grew, had been in grass several years, and no manure put on it. July, 1846, I cut from it about 200 wt. of hay. Ploughed on the 20th; on the 25th, spread 25 lbs. guano, and 4 loads compost manure, and harrowed it. August 10th, 11th, and 12th, thinned, and weeded the turnips. On the 7th November, pulled the same.

Expense of Cultivation.

Ploughing,	75
Carting on, and spreading manure,	$1 00
Harrowing,	75
Four days thinning and weeding,	4 00
Four days pulling, and cutting tops,	4 00
Four loads manure,	2 00
25 lbs. guano,	75
Seed,	40
Total,	$13 65
Crop, 81¼ bushels, at 25 cents per bushel,	$20 31

BARNSTABLE COUNTY AGRICULTURAL SOCIETY.

The annual meeting Cattle-show and Fair of this society, was held at Barnstable, October 21st, 1847. The weather was delightful, and the gathering of spectators much larger than on any preceding year. The number of animals on exhibition, was nearly double that of any former show. Owing to an unfavorable season, the exhibition of fruit was not larger than on previous occasions.

The address was delivered by the president of the society, Hon. John Reed, of Yarmouth.

On Farms.

In the performance of their duty, the committee have traveled nearly from one extreme of the county to the other, to examine into the present condition of its agriculture, and note the improvements which have been adopted in the management of farms, and in the cultivation of particular crops. Though the inhabitants of this county are, as a whole, a commercial people, the committee observed, in all the towns, the evidences of an increased interest in rural employments. The old system of planting exhausting crops for successive years, until the diminished products do not repay the labors of the husbandman, now finds few advocates among the observing and the intelligent.

Very few now plant more land than they can manure, and lay down to grass, in better condition than it was when broken up. More attention is paid to the collecting of materials, and the making of compost manures; to the kinds of crops which

are to succeed each other; to the reclaiming of swamps and boggy lands and meadows, and the cultivation of trees and shrubbery for use and ornament. The effects of these improvements are visible in all our towns, in the appearance of the pastures and meadows, of the crops, of the enclosures, and of the grounds about the buildings.

The attention of the people has generally been directed to the utility of planting forest trees on the sandy commons and beaches of this county. Forest trees improve the soil on which they grow, and are a source of profit for timber and fuel; but their greatest use is, the protection which they afford to the cultivated fields against the winds from the ocean, which stint and blast vegetation exposed to their unbroken violence. The high price of corn last spring, induced the farmers in this county to extend its cultivation, and more land was planted with corn, than in any one year for a long time past, probably more than was ever planted. The crop is not so good as last year. Many complain that the ears are not well filled; but on rich, well-manured, and well-cultivated lands, the yield proves abundant. The potato crop is almost a total failure. The rot prevails in all the towns, and the committee have scarce met with one who did not complain of his loss. Nearly all the instances in which potatoes have not suffered from the disease, are, where dry sea-weed was used for a manure. Little fruit has been raised this year. The trees, particularly the apple, have suffered from the depredations of worms and insects, some species of which have been unknown in this county till within a few years. The committee cannot, in this report, refer to all who have made valuable and economical improvements in the cultivation and management of their farms and appendages. The following, among others, they conceive to be deserving of particular notice.

Thomas Lathrop has accomplished a task, which men of ordinary enterprise and industry would have considered impracticable or visionary. He has rendered fields, taken up in the low lands, among the barren sands of Provincetown, fertile in the production of corn, grass, and vegetables.

John Doane, of Orleans, has, by skilful management, rendered his farm five times as productive of grain and grass, as it

was when he purchased it, twenty-seven years ago. The soil was then exhausted, and most of it was thrown out to commons. The soil is generally light and sandy, and he has renovated it by carting and ploughing in sea-weed, and by making compost manures in his barn-yard. The principal material used by him, is sea-weed.

Simeon Higgins, of Orleans, has also greatly improved his lands. He has made nineteen acres very productive, which, a few years ago, were barren, and of little value.

The largest farms visited by the committee, were those of Lewis Doane and Beriah Doane, situated in the east part of Orleans. Lewis Doane's farm contains about one hundred and thirty acres of arable land. The soil is naturally good, and easily cultivated. He has clay, loam and sandy soils. His average annual crops, for several years, have been 500 bushels of corn, 250 bushels of rye, wheat and barley, besides potatoes, carrots, &c. He pastures from 25 to 30 head of cattle, 50 sheep, and 3 horses. The hay which he cuts is consumed on the farm, and he depends mainly on sea-weed for manuring his lands. Beriah Doane's farm contains about two hundred and thirty acres of arable land. The soil is mostly clay, and gravelly, and is naturally rich and productive. He pastures about 30 head of cattle, 50 sheep, and 4 horses, and raises annually an average crop of 750 bushels of grain.

Charles Sears, of Yarmouth, paid $350 for his farm, adjoining his homestead, in 1832, and it was then thought he paid its full value. It contains about thirty acres, and its annual productions, at that time, were, pasturage for two cows, and twenty-five bushels of grain. Now, the same land produces annually, pasturage for three cows, ten tons of English hay, two hundred bushels of grain, and one hundred bushels of potatoes, and other vegetables. Most of his land is sandy; a small portion, sandy loam and peat. On a part of the peat land which he has reclaimed, he cut, this year, at the first mowing, hay at the rate of four tons per acre. He has a field of four acres planted with corn, which will yield at least forty bushels to the acre. Mr. Sears, besides the manure from his stables, composts two or three hundred loads of manure annually from sea-weed, marsh, and fresh pond mud, and other substances.

Only two farms were entered for premiums, and they were visited, in July and October, by the Committee. James H. Knowles's farm, in Eastham, contains nineteen acres of arable land, of easy cultivation. The soil is mostly a sandy loam, rich and deep, and abounding in shells. Mr. Knowles is an intelligent and skilful farmer, and turns every thing on his premises to some good account. His buildings and fences are substantial and neat. He has, (what no good farmer should be without,) a cellar under his barn, open on the side next to his large barn-yard. He has made about 400 loads (of 25 bushels each) of manure the present year. His cattle are yarded every night, and their droppings, and the manure from his stable, are immediately mixed with the materials carted in. Mr. Knowles has pastured on his farm, the present year, fourteen head of cattle, two horses and one colt; and cut ten tons of English hay. He planted two and a half acres to corn, the estimated product of which is forty bushels an acre; three and a half acres of rye, which produced sixty bushels; three fourths of an acre of oats, thirty-five bushels; one acre of barley, thirty-seven bushels; and half an acre of potatoes, seventy bushels. Besides the above, he has raised beets, carrots, and other vegetables. The gross income of his farm, last year, was $547, and his expenses for hired labor were $90.

The farm of Braley Jenkins, Jr., of West Barnstable, was also entered for a premium. His farm is not one of the largest or most productive in the county. The soil is mostly sandy. A portion is loam, and naturally good. During the past year, much attention has been paid to the composting of manures, and the appearance of the grounds and crops indicates careful and skilful management.

The committee have awarded—

To James Knowles, of Eastham, 1st premium, $8 50, and a copy of Farmers' Dictionary.

To Braley Jenkins, Jr., of Barnstable, 2d premium, $6 00.

AMOS OTIS, *Chairman.*

James H. Knowles's Statement.

My farm contains about nineteen acres of tillage land, about two acres of fresh meadow, which I pasture after mowing, and about two acres of shore-feed adjoining the farm. I pasture 14 head of cattle, and two horses. I keep under cultivation about seven acres. I break up from two to two and a half acres a year; first taking a crop of corn; next a crop of rye, oats or barley; the third year I plough under the stubble, in August or September, then put on a good coat of manure, and go over it with the cultivator, and harrow till it is well mixed. I then sow it down with rye and hay-seed: the third crop is generally the best, and leaves the land in much better order for mowing. My rule has been, for twenty years or more, not to plough any more land than I could cover over with manure. In regard to manure, I think the more different the materials that can be got together, the better the manure will be. I would recommend a roller to every farmer. I have had one about two years, and I should as soon think of doing without a harrow as without a roller. I built a barn, in 1840, twenty-eight by thirty-six feet, and a cellar the whole bigness of the barn. I would recommend, to every farmer, to have a cellar under his barn, as he can then save the urine from his stock, which I consider equal to the solid manure. I would also advise every farmer that lives near the seashore, to use muscle-mud freely. I have used it for many years, and find it the best of any one kind of manure that I ever used. I have cut on an average, the last three or four years, 8 tons of English Hay, averaging about $10 per ton. $80 00

Average of Corn on 2½ acres,	100	bushels,	-	100 00
Do. of Rye on 4 acres,	65	"	-	65 00
Do. of Oats on ½ an acre,	20	"	-	10 00
Do. of Barley on ½ an acre,	17	"	-	10 00
Do. of Potatoes and other roots,	150	"	-	60 00
Do. of Apples,	35	"	-	20 00
Do. of Beans,	4	"	-	8 00
Keep 50 hens, and have about 200 dozen of eggs,			-	25 00
Make about 200 lbs. of butter, worth -	-		-	40 00
Increase from stock, about -	-	-	-	75 00

Keep 4 or 5 hogs, and sell about 20 pigs, profits about	$100 00
Raise about 1000 pumpkins, worth about - -	20 00
	613 00
Hired labor besides my own, - - - -	150 00
	$463 00

Eastham, Nov. 3, 1847.

Braley Jenkins Jr.'s Statement.

Up to the year 1837–8, we had kept two cows, a pig, and one or two cosset sheep. The produce of the field and garden was, of corn about 30 bushels, potatoes 20 bushels, with garden vegetables enough for culinary purposes. There had been no more manure made, than what naturally accumulated; the produce of hay was about 1½ tons, and of course we had to buy some hay. At this time we added a horse to the stock, and commenced carting, to the pig-yard, soil from the road-side; from that time to this, we have yearly increased our exertions, so that the last year, we carted out of the yard, and compost-heap, 220 loads of manure, of 20 bushels each. We have not the facilities for making manure that most farmers in this vicinity have; we have to depend almost entirely on peat (which has to be carted one mile) and soil from the road-side, composted in our yards, with the excrements of the cattle.

In 1840, we purchased land adjoining, 3½ acres, which had served as pasture for one cow, and land across the road, 20 acres, which had been exhausted by cropping, and thrown out to common, light sandy soil. This was fenced in for sheep. The manner of cultivating was formerly to plant with corn, followed with rye, and the land left to recover itself and get grassed over at its leisure. The system we have practised, since improvement began, has been to cultivate less land, to manure more highly, and lay down to grass in the following order; corn, then green or root crops, then spring grain with grass-seed. The farm has increased steadily in its produce, up to the present

year,—which is, of corn, 120 bushels, potatoes, 100 bushels, turnips, 45 bushels, beets and carrots, 5 bushels, cabbages, 135, pumpkins, $8 00, beans, 4 bushels, English hay, 10 tons. All the cultivated or grass land, except the sheep pasture, is about ten acres. About 225 rods of stone-wall has been made since 1840. I work at carpenter's work through the summer, so that most of the labor is done in winter, in collecting materials for manure. My father, now 74 years of age, my brother, who is a practising physician, and a boy ten years old, have also worked on the farm.

Barnstable, Nov. 8, 1847.

Milch Cows.

There were only three cows, that came within the society's limits in regard to age, presented for premium. One from Joseph Huckins, of Barnstable, six years old last spring, calved in May last, gave, from the 10th to the 20th of June, 18 qts. of milk per day, from which were manufactured $1\frac{1}{4}$ lbs. butter; and from the 10th to the 20th of Sept., 12 quarts per day, making 1 lb. of butter. Her feed, pasturage alone. The committee award, to Capt. Huckins, the first premium of $6 00.

One four years old cow, from Edward Thacher, of Yarmouth, from the 10th to the 20th of June, gave an average of $14\frac{3}{4}$ quarts of milk per day, weighing $36\frac{3}{4}$ lbs.; and from the 10th to the 20th of Sept., 12 quarts per day. A considerable quantity of the milk having been daily sold, the quantity of butter, which might have been made, could not be correctly ascertained. A premium for the second-best cow is awarded to Mr. Thacher, of $5 00.

A cow, belonging to Matthias Hinckley. The age we could not ascertain. She now gives 7 quarts of milk per day. Her two last calves, at the age of 6 weeks, weighed respectively 131 and 127 lbs. Her feed, pasture; neither vegetables or grain have ever been given her. A premium, for the third-best cow, is awarded to Capt. Hinckley, of $4 00.

Your committee would also state that the animals were all fine-looking, and do honor to the farmers of the Cape.

Z. D. BASSET, *Chairman.*

PRODUCE.

The committee find several applicants for premiums on corn, but as some have not harvested their corn crop, the committee recommend that the award of premiums be deferred for the present, and left for the action and decision of the Executive Committee. No application for premium on rye.

We award to Joseph Bodfish, for the best experiment on Oats, the first premium of $3, for thirty bushels on eighty-one rods.

Also to J. Bodfish, for the best growth of beans, $4, he having raised six bushels on forty-eight rods.

To Joseph Allyn, for the best onions, $3, he having raised 195 bushels on one fourth of an acre.

And the committee recommend an award of $1 to Leonard L. Lumbert, for a specimen of sweet potatoes.

NATH'L HINCKLEY, *Chairman.*

FRUIT TREES.

The committee on fruit trees have awarded, to Lot Hinckley, of Barnstable, a premium of $3, for the best peach orchard. Mr. Hinckley has 204 trees set since 1843, all in a healthy condition. A part of the trees bore abundantly last year, but, this year, the blossoms were destroyed by late frosts.

Enoch Shove, of Sandwich, also entered his peach orchard of 53 trees, which are in a healthy and flourishing condition.

To Seth F. Nye, of Sandwich, a premium of $2 for 27 engrafted pear trees. Specimens of Seckel, Louise Bonne de Jer-

sey, Beurre Diel, Napoleon, Winter Belle and Winter Beurre pears, were exhibited by him, which were very large and beautiful.

AMOS OTIS, *Chairman.*

Cranberries.

Specimens of cranberries were exhibited by Leonard L. Lumbert, Edward Thacher, Sophia Scudder, John W. Scudder, Thacher Hinckley, and Alexander Howes. Some of the fruit was picked in natural bogs, and, for such, the Committee were not authorized to award premiums.

Edward Thacher, of Yarmouth, entered two pieces of land planted to cranberries; one, of a quarter of an acre, and the other, of two rods, and exhibited specimens of the fruit. He also exhibited several specimens of the different varieties of the cranberry as they grew on the vines. Mr. Thacher has more land planted than he entered for premiums.—They have awarded to Edward Thacher, of Yarmouth, the first premium, $5 00. To Leonard L. Lumbert, of Barnstable, $1 00.

SETH PARKER, Jr., *Chairman.*

Edward Thacher's Statement.

The quarter of an acre on which I claim a premium, was set with cranberry vines last spring. The bog was formerly a mill-pond, and the soil is a mixture of peat mud, and was covered with a coarse grass. Last winter, when the ground was frozen, I carted from the adjoining upland, and covered the bog from three to ten inches deep with coarse sand. I consider ten inches none too deep, as cranberries so set will require no hoeing. In covering the bog, one rod of upland was cut down sufficiently to set cranberries for every three covered. The vines were set in April, May, June, and a few, for experiment, in August. The hills were placed about two feet apart, and the runners of the

vines have generally extended from hill to hill. The plants were all selected the year preceding when in fruit, and marked by putting down sticks beside them. The produce, this year, was about half a bushel.

The whole amount expended on the quarter of an acre is—

For carting on the sand, ...	$11 68
Setting the vines, ...	4 00
Hoeing the same, ...	4 12
Whole expense, ...	$19 80

The water was drawn from the two rods entered for premium in June, 1845, and the vines were set by shoving them with the hand into the mud. No sand was carted on, and I have not expended more than two hours' labor on the two rods. This bog is kept covered with water in the winter and spring, till the first of May. The cranberries are of a large variety, and somewhat peculiar in their form: at the stem and blossom-ends there are projections not usually observed in this fruit. The color on the side next the sun is deep red, and, underneath, a pale red or yellow. I am thus particular in the description of the fruit, because I think it an excellent variety for cultivation. It is very productive, blossoms a week or fortnight later than any variety I have noticed, is hardy, and I have not known the blossoms to be injured by the late frosts.

The first year, the vines produced but a few berries, last year four quarts, and this year, two bushels and twenty quarts, or a bushel and ten quarts to the rod.

Yarmouth, Oct. 20, 1847.

Leonard L. Lumbert's Statement.

About the year 1836, my cranberry vines were quite unproductive, and, to alter if possible such a state of things, I commenced the experiment of transplanting the vines to a piece of swamp-land or peat-bottom, which formerly was wooded with cedar, maple, and pine, containing three and one half acres. I

have continued transplanting until the present year, and I find it works well. I have gathered, this year, from six quarts to one half-bushel per rod—making seventy-five bushels gathered, and, to appearance, there are more than twenty-five bushels on the bog not yet gathered. These cranberries are of a superior quality, and are readily sold from $3 00 to $3 25 per bushel. To protect the vines from the frost, I have, in some instances, covered them with cotton cloth; the cloth is raised about two feet from the surface, and answers the purpose for which it is designed. The cloth cost $1 80 per rod, and may, with care, last several years. The cost of transplanting, on an average, is 75 cents per rod.

West Barnstable, Oct. 20, 1847.

Domestic Manufactures.

The Committee cannot forbear the expression of their regret, that the exhibition of articles of Domestic Manufacture was not larger and more extensive. Where there is no competition, there can be no great interest excited, either in the exhibitor or the observer, and, surely, it is no very hard task for a committee to decide the merits of "best" and "next best" between only two articles exhibited. But where there is an array of many different things, from different hands, stimulated by various tastes, though all cannot succeed in the competition, they will have subserved the higher purpose of improving the taste, and giving energy to the industry, of the families of our society. The Committee wish that their successors may have a harder task, in the way of discrimination and judgment, than they have been called on to perform to-day.

Your committee ask leave also to suggest, to their co-laborers in the cause of American industry, that they bring, to the next exhibition of the Society, a more complete display of the *useful* articles of domestic economy, wrought by no water-power, or labor-saving machinery, but by the willing and skilful hands of the ladies of Cape Cod. When it is recollected, that this exhibition

of domestic and fancy articles is the principal attraction that brings to our annual jubilee those very ladies themselves, without whose presence the day would be dull indeed, it cannot be wondered that a part of the committee, (without any objection from the other part,) should plead for an increased show and more extensive fair in that respect.

GEO. MARSTON.

ABSTRACT,

Showing for what objects Premiums were OFFERED *by the several Agricultural Societies in* 1847, *and the amounts of the same.*

SOCIETIES.	Bulls.	Milch Cows.	Heifers.	Working Oxen.	Greatest number of pairs of Working Oxen from any town.	Steers.	Fat Cattle.	Horses and Colts.	Sheep.	Swine.	Poultry.	Ploughing—double teams.	Ploughing—single ox teams.	Ploughing—horse teams.	Ploughing with horses or oxen.	Subsoil Ploughing.	Effects of Subsoil Ploughing.	Management of Farms.	Reclaiming Wet Meadows.	Subduing Bushes in pastures.	Exterminating Weeds in pastures.	Irrigation.	Experiments on Manures.	Turning in Crops as a Manure.	Preparation of Compost Manure.	Application of Compost Manure to mowing fields.	Application of Sea Weeds.
Essex, . . .	$18	$22	$28	$22	.	$28	$38	$28	.	$30	.	$28	$20	$20	.	$10	$18	$55	$45	.	$25	$22	$25	$15	.	.	.
Middlesex, . .	20	21	30	30	.	29	14	.	.	30	.	28	28	12	.	.	.	72	40	.	.	.	.	.	$15	.	.
Worcester, . .	9	13	25	20	.	21	37	.	$16	14	$14	.	35	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hampshire, Franklin, and Hampden, . .	28	14	.	30	$53	21	20	72	12	12	10	.	.	.	$46	.	8	.	10	.	.	.	10	15	.	.	.
Hampden, . .	16	21	15	28	32	23	19	40	11	20	.	.	.	.	31	.	6	45	10	.	.	.	7	9	9	.	.
Berkshire, . .	25	38	21	44	.	32	9	37	54	18	.	.	27	27	.	.	.	.	.	.	.	.	.	.	.	.	.
Plymouth, . .	17	18	27	20	.	24	28	.	.	.	.	.	42	.	.	.	16	.	50	$16	.	.	17	.	24	$25	$16
Bristol, . . .	44	28	14	21	.	23	18	8	10	18	.	9	20	9	.	.	.	25	.	.	.	.	15	.	.	.	.
Barnstable, . .	20	20	10	27	.	11	22	51	11	.	.	15	15	8	.	.	.	18	12	.	.	10	11	9	.	.	

ABSTRACT—*Continued.*

SOCIETIES.	Butter.	Cheese.	Honey.	Maple Sugar.	Grain Crop.	Root Crop.	Bean Crop.	Hay Crop.	Hay Seed.	Fruits and Vegetables.	Cranberries.	Forest Trees.	Trees set on the Road-side.	Fruit Trees.	Mulberry Trees and Silk.	Cocoons and Silk.	Introduction of new and valuable Grasses.	Comparative value of Crops as food for cattle.	Fattening Cattle and Swine.	Experiments to determine proper distances at which to plant corn.	Experiments to determine proper time to cut Forest Trees which shoot from the stump.	Implements and Inventions	Agricultural Essays.	Domestic Manufactures.	Discretionary Premiums.	Whole amount.
Essex, . . .	$48	.	.	.	$40	$36	$8	.	.	$50	$25	$30	.	$70	.	.	.	$40	$15	.	.	$10	$10	$95	.	$974
Middlesex, . .	10	.	.	.	42	23	.	.	.	.	50	93	.	73	$60	.	.	.	.	.	.	10	.	48	$50	828
Worcester, . .	12	$18	.	.	.	20	.	.	.	.	.	30	.	.	.	.	.	.	.	.	.	.	.	37	50	*371
Hampshire, Franklin, and Hampden, . .	6	6	.	.	30	24	5	.	.	.	10	20	.	.	.	.	.	.	10	.	.	.	.	40	200	712
Hampden, . .	22	22	$6	.	16	12	4	.	.	.	7	10	.	32	.	.	.	14	5	.	.	.	.	40	100	632
Berkshire, . .	18	18	.	$5	105	22	.	.	$6	9	.	.	.	.	.	.	.	.	.	.	.	.	.	101	.	616
Plymouth, . .	23	22	.	.	67	52	10	.	.	30	17	150	.	.	.	$12	.	.	.	$20	$25	12	.	125	.	905
Bristol, . . .	21	12	9	.	45	19	23	$9	.	14	15	120	$22	29	.	.	$8	.	.	.	.	.	.	100	.	708
Barnstable, . .	10	10	.	.	35	14	4	.	.	6	9	13	.	6	.	.	.	.	.	.	.	5	.	31	.	413
																										6159

* There were also offered, as premiums, by the Worcester Society, books to the amount of $251 47. Agricultural publications were also offered, as premiums, by several of the other Societies.

ABSTRACT,

Showing for what objects Premiums and Gratuities were AWARDED *by the several Agricultural Societies in* 1847, *and the amounts of the same.*

SOCIETIES.	Bulls.	Milch Cows.	Heifers.	Working Oxen.	Greatest number of pairs of Working Oxen from any town.	Steers.	Fat Cattle.	Horses and Colts.	Sheep.	Swine.	Poultry.	Ploughing—double teams.	Ploughing—single ox teams.	Ploughing—horse teams.	Ploughing with horses or oxen.	Subsoil Ploughing.	Effects of Subsoil Ploughing.	Management of Farms.	Reclaiming Wet Meadows.	Subduing Bushes in pastures.	Exterminating Weeds in pastures.	Irrigation.	Experiments on Manures.	Turning in Crops as a Manure.	Preparation of Compost Manure.	Application of Compost Manure to mowing fields.	Application of Sea Weeds.
Essex, . .	$12	$22	$16	$22	.	.	$28	$32	$5	$25	.	$28	$20	$20	.	$10	.	$10	.	.	.	.	.	.	.	.	.
Middlesex, . .	14	21	24	30	.	$24	14	.	.	27	$3	28	28	12	.	.	.	80	$12	.	.	.	.	.	$15	.	.
Worcester, . .	9	13	25	20	.	22	27	.	8	8	12	.	27	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hampshire, Franklin, and Hampden, .	13	14	4	35	$118	28	20	72	9	11	.	.	.	.	$46	.	.	.	8	.	.	.	.	.	.	.	.	.
Hampden, . .	18	22	19	41	27	31	18	58	13	24	.	.	.	.	30	.	.	.	.	.	.	.	.	.	.	.	.	.
Berkshire, . .	5	34	22	44	.	41	.	37	55	23	.	.	27	27	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Plymouth, . .	17	18	27	20	.	19	24	.	.	.	.	.	43	.	.	.	.	.	24	$10	.	.	.	.	15	.	.	.
Bristol, . .	41	28	9	23	.	24	18	11	7	17	1	10	24	10	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Barnstable, . .	20	15	5	25	.	7	22	31	6	.	.	15	18	8	.	.	.	16	.	.	.	.	.	.	.	.	.	.

ABSTRACT—*Continued.*

SOCIETIES.	Butter.	Cheese.	Honey.	Maple Sugar.	Grain Crop.	Root Crop.	Bean Crop.	Hay Crop.	Hay Seed.	Fruits and Vegetables.	Cranberries.	Forest Trees.	Trees set on the Road-side.	Fruit Trees.	Mulberry Trees and Silk.	Cocoons and Silk.	Introduction of new and valuable Grass.	Comparative value of Crops as food for cattle.	Fattening Cattle and Swine.	Experiments to determine proper distances at which to plant corn.	Experiments to determine proper time to cut Forest Trees which shoot from the stump.	Implements and Inventions.	Agricultural Essays.	Domestic Manufactures.	Whole Amount.
Essex, . . .	$18	.	.	.	$8	$21	.	.	.	$43	$15	.	.	$22	.	.	.	.	.	.	.	$18	$50	$88	$563
Middlesex, . . .	10	.	.	.	8	6	.	.	.	90	.	.	.	70	.	.	.	.	.	.	.	.	.	93	609
Worcester, . .	12	$18	.	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	32	*236
Hampshire, Franklin, and Hampden, . .	6	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	51	441
Hampden, . . .	22	20	.	.	.	.	.	.	.	27	.	.	.	.	.	.	.	.	.	.	.	6	.	98	474
Berkshire, . . .	18	18	.	$5	110	20	.	.	$6	9	.	.	.	.	.	.	.	.	.	.	.	9	.	101	611
Plymouth, . . .	36	20	.	.	43	21	$8	.	.	26	.	.	.	.	.	.	.	.	.	.	.	6	.	123	500
Bristol, . . .	26	14	$7	.	.	5	5	.	.	28	.	.	$5	.	.	.	.	.	.	.	.	.	.	55	368
Barnstable, . .	10	10	.	.	3	4	4	.	.	9	6	.	.	6	.	.	.	.	.	.	.	.	.	40	280
																									4082

* There were also awarded, as premiums, by the Worcester Society, books to the amount of $200 60. Agricultural publications were also awarded, as premiums, by several of the other Societies.

SELECTIONS FROM ADDRESSES

TO

AGRICULTURAL SOCIETIES.

Improvements in Agriculture.

[*Extracts from an Address by* Thomas E. Payson, Esq., *at the last Fair of the Essex Agricultural Society.*]

On the annual return of this day here and elsewhere, the great *Improvements* in modern Agriculture have been frequently made an interesting topic of discourse. Thirty years have, indeed, wrought wonderful changes in farming as in every thing else. It is also true, in nothing else has change been effected with so much difficulty. Ignorance and obstinacy have always sneered at improvement. Nor have innovations in agriculture had these alone to contend with; but blind *error*, which "like the adder stoppeth her ears, and will not listen to the voice of the charmer, charm he never so wisely," has always stood in their way. It has been said that "*error*, when she retraces her footsteps, has farther to go before she can arrive at truth than ignorance;" but the way which she takes to get out of the heads of some farmers, is the crookedest road, that it ever entered into the imagination of man to conceive. Why, if the best iron plough of this day had been presented to a farmer thirty years ago, he would as soon have told the assessors that he was not taxed high enough, as to have used it. But, though old superstition is in its grave, and many an ancient prejudice lies buried beside it, the race is not quite extinct.

But the fact that great improvement has been made, and *is making*, is of more importance to our present purpose. Men have found out, that, if he who plants an oak looks forward to future ages and plants for posterity, he who plants a fruit-tree does it for himself as well as for those who come after him; that, to graft an apple tree, is better than to suffer it to grow wild; that manures are quite as efficacious, when properly composted, as when used fresh from the barn-yard; that sixty bushels of corn to the acre are more profitable than thirty; that to sow grass with grain in the spring, and have four-fifths of it destroyed, is not so well as to sow it by itself in the autumn and get two or three tons of hay to the acre the next season; that repeated, shallow skimmings of the surface-sowed soil is not good ploughing; and that, to pass a roller over fields sowed with grain or grass, is better than to leave them in Indian hills. Some of them have learned that gravelly knolls and sandy highlands are not the only soils which pay for cultivation; but that our rich peat bottoms, covered with underbrush, weeds and water-grass, which have been abandoned to the caprices of nature ever since the ark rested on Mount Ararat, do in reality possess intrinsic value.

These deep meadows, which send forth from their dark bosoms the chilling dampness of disease and death, adding to the coldness and poverty of the adjoining highlands by their unhealthy evaporations, seem to be so placed, by Him who made the world, to say to man in stronger language than words, that labor properly applied shall prove a blessing rather than a curse. There they lie, side by side, scattered all over the county, the bog exuberant with unwholesome vegetation, the highland with its stinted growth of scanty herbage, both soils worthless and unprofitable, but each of them rich in all the elements of fertility which the other requires. Let the farmer do what a benignant nature encourages him to do, and these poor soils of New England which, under bleak influences, are fostered into a sickly fertility, will be quickened into almost spontaneous luxuriance.

But to enumerate *all the improvements* which have been made in agriculture for the last half century would take too much

time. *One*, not only an improvement in itself, but the basis of all other improvements, must not be omitted, and that is the diffusion of agricultural knowledge by the newspaper press. Slowly, silently, almost by stealth, without the knowledge of the man himself, this mighty engine undermines old prejudices, and has taught the farmer that, however independent he may be, he is not so much so, as that the experience of others will not profit him. Most of us have become willing to *seek directions*, even if they are contained in a *book*. We are becoming more like liberal, free-born, and aspiring men.

Yet, after all, agricultural improvement is in its infancy, and to nurture its youth and rear it to manhood, has been left to us, and to those who are to come after us. To direct how this shall be done is a difficult task. I shall, however, upon two or three of the most important questions connected with the subject, venture to give an opinion.

All will agree, that the *basis* of improvement lies in a more *thorough tillage*. Now one great hindrance to this, is the strong and universal tendency among farmers to own and cultivate too much land. I am well aware that I tread on disputed ground, and that there are those among us whose opinions we are ready, and *with good reason*, to esteem almost as oracles, who "have no sympathy with this small-farm theory." But, with due deference to their opinions, may I not start with this fact, that the case so commonly occurs as to make it a general rule, that our very large farms are very poorly cultivated? To the point which I have in view, is the apologue of the vine-dresser who had two daughters and a vineyard. When his oldest daughter was married, he gave her a third part of his vineyard for a marriage-portion, notwithstanding which, he had the same quantity of fruit as before. When his youngest daughter was married, he gave her half of what remained, still the produce of his vineyard was undiminished. The secret was simply this,—that the more thorough tillage which he was enabled to give to the remaining third part, tripled his produce, while, at the same time, it reduced the cost of cultivation. Now, he that cultivates the most land, or produces the greatest crop, is not the best farmer, but he that can do it with the least expense. In Massa-

chusetts, the high price of labor is an insuperable objection to large farms. As it is, men must not only not be idle, but must at all times, and under all circumstances, work to the best advantage, or the proceeds of their labor will not pay their wages. Upon large farms, numerous and long lines of fence are to be kept in repair, taxes are to be looked after, work cannot be so economically done, because much of it is at a distance, and a large number of laborers must of necessity be employed, who, to use an old adage, if they are not very carefully looked after, will be likely to drink out of the broad end of the tunnel, and hold the little one to their employer. I must not be understood to say that no *man can profitably* manage a large farm here. All rules have their exceptions. But I do say, that there are very few Bonapartes in agriculture, and that the great body of us are fit only to serve in the ranks.

It is *doubtful indeed*, if these large farms are the most profitable *any where;* for in countries where the cost of labor is almost nominal, small farms are said to produce the largest income. Stretching along at the foot of the Alps, those ever-memorable mountains, whose lofty summits, white with eternal snows, reach far above the clouds—the birth-place of the glacier and the avalanche—is that province of Italy which has been often called the garden of Europe. Its inhabitants are farmers, and very few farms contain more than seventy-five acres; yet the best authority asserts that these small farms bring more to market than the large ones, and that there is no country in the world which can dispose of so large a portion of its productions as Piedmont. True, the soil is rich, deep, if you please, alluvial. The climate is moist, and the situation of the land makes it susceptible of being easily submitted to irrigation. After all, the mainspring of this abundant fertility is thorough tillage, which consists only with small farms.

We have not the same natural advantages, but the deficiency can be partially supplied by liberal manuring. Without this, you may plough the soil and sub-soil, eradicate every noxious weed, studiously watch the progress of infant vegetation, and not get half a crop. And not only must we manure *liberally*, but our manures must be adapted to the different soils and different crops.

Here, most certainly, there is a wide field for improvement. The Chinese are said to be familiar, not only with the relative value and efficacy of manures, but to understand, and apply without loss, that which is best fitted to stimulate and support each kind of plant. *With us*, agricultural chemistry has made rapid advances within a few years. Yet, in practice, I question very much, whether the ancients were not better cultivators of the soil than we are. "What are the elements of good tillage?" says Cato, the oldest Roman teacher of agriculture. "To plough. What is the second? To plough. The third is to manure. Study to have a large dunghill," says he, "keep your compost carefully; when you carry it out, scatter it and pulverize it." This was advice given one hundred and fifty years before the Christian era, yet many of us are apt to regard composting as a *new discovery*. Subsequent writers advise the cultivator "not to carry out more manure than the laborers can cover with the soil the same day, as exposure to the sun does it great injury; and they tell us that the farmers of that day collected their manure and stored it in covered pits, so as to check the escape of the drainage." How many farmers in the county leave their manure exposed to sun, and air, and rain, for half the year! Are there not some who will tell you that it is *improved* by the operation?

One powerful fertilizer, little thought of, and less cared for, must, I am satisfied, sooner or later come into general use, and that is *liquid manure*. *Now*, it is not considered worth the pains of saving, but *its value* is ascertained beyond question. Take, for instance, the house plant, which your wife, or your daughter, rears with care. Water it with a solution of guano, no matter whether brought from some distant island of the sea, or more cheaply obtained from the floor of your pigeon-house—and what is the effect? At once it stands more erect, its leaves enlarge and assume a deeper hue, and what may have been just now but a sickly nondescript, seemingly out of season and out of place, puts on the beauty and vigor of natural and luxuriant growth. On a large scale, apply it to your grass-lands, and what will be the result? Do you say this is mere supposition, and that a grain of experience is worth all the speculation in the world?

Mark that spot of ground which is blessed with the drainings of a barn-yard. It may be, in common parlance, the *coldest spot* in the field. There the grass, as if the recent snow had given it life, starts earliest in spring; there it is clothed with the deepest green; and there the scythe of the mower finds the thickest and heaviest grass. The aftermath nearly equals the first crop, and the cattle, if suffered to do so, feed latest upon it in the autumn. This is no matter of speculation—but it becomes an instructive fact. In Flanders,* and when we speak of Flemish farmers, we speak of men worthy of imitation, this species of manure is relied on more than any other; and in China, where every town has its sworn broker expressly for the purpose of examining night-soil, it forms a fourth part of all the manure used. Yet, notwithstanding its known value, a great majority of us suffer it to run to waste, and in the largest public establishment† in the county of Essex, until recently, if not now, this great element of fertility has been suffered to escape into the sea.

Another matter worth a moment's attention, is the *Feeding of Stock.* A Southern gentleman, when about to commence farming, was led to inquire, of an experienced neighbor, what was the best mode of making corn. "*Keep your work-horses fat,*" was the reply. Experience proved to him who made the inquiry, that this hint comprehended every thing connected with good cultivation, although neither of them knew, at the time, that Cato had said, two thousand years ago, that the secret of farming consists in feeding well.

Large sums of money have been spent, by individuals and societies, to improve our breeds of cattle. The best foreign varieties have been made available to the man of the most limited means. Far be it from me to say a word to discourage this laudable enterprise, which has already effected much good, and is destined to do much more; but when the merits of foreign varieties have been blazoned abroad, and the inferiority of our native breed carefully exaggerated, I have sometimes thought that the sin of its owner was laid at the door of the brute beast. Feed our cattle as they should be fed, and, except symmetry of form

* The recent manure of a single cow is valued in Flanders at ten dollars per year.

† House of Correction, &c., at Ipswich.

and a notable pedigree, what advantage has this imported stock over them? Do they make better oxen? Universal opinion has long ago settled this point against them. Are they better cows? It is generally conceded that the Durham short-horns are not. But no matter whether you have Durhams, Devons or Ayrshires: so long as they are not well fed and cared for, you will have no better cattle than that ill-favored native stock which, in many places, like the lean kine of Pharaoh, seem to be forsaken of God, and abused by man. Particularly is it the case among those men who, for distinction's sake, may be called salt-hay farmers,—and not inappropriately so termed—for if there is any vegetable product upon which they set their hearts more than another, it is the natural growth of unreclaimed salt-marsh.

Those of us who come within this class, make no improvement, and can make none. Our farms, except perhaps a few acres about our dwellings, diminish in value. We plant but little, for, although the ocean is upon one side of us, and rich peat-bogs on the other, both ready to furnish an inexhaustible supply, we have little manure. We deny our cattle the benefit of scanty litter, for there is nothing in the shape of fodder, that cattle fed on salt-hay will not greedily devour. Our meadows, capable of being easily reclaimed and made as fertile almost as the prairies of the West, remain as they were a hundred years ago. Every year the unchecked clumps of bushes and briars are making greater inroads upon our open pasture lands. Stone walls, carefully built by our ancestors, which time has shattered, are hastily and slovenly bolstered up, to answer the demands of the present day, while the worthless shrubs which hedge them in, are preserved as a sort of heir-loom, for the benefit of posterity. The time best suited for reclaiming our fresh meadows, for collecting manures, and for the general improvement of our lands, is neglected. Still we are not idle, but indoors and out, at this season, labor is unprofitably increased. The dawn of day finds us three, five or ten miles from home, engaged in our favorite business. And why do we turn night into day? Not from choice, but necessity; for be it known, that a blade of Damascus will not cut this nutritive salt-grass,

unless it is moistened by the rain or the dew. Here we toil, until the approaching frost compels us to gather in the scanty harvest. We are obliged to sell the *best* of our products, to meet our expenses. Our horses and working cattle eat up the better portion of what is left, while our half-starved cows, and other stock, get the poor remainder—always thankful if perchance a lock of decent fodder comes within their reach. The consequence is, our new milch-cows, with scarcely flesh enough to prevent the skin from adhering to the bone, are worth but little more in the spring than they were in the autumn. Our manure heaps are no larger than they were the previous year. We can neither cultivate more land nor to better advantage. The result of all our labor is, that, by going the same round from year to year, we can barely get enough to keep soul and body together, and never find time to advance one step in the path of improvement. We are content to imitate the example of the elder Laird of Dumbiedikes, whose dying charge to his son you will all recollect,—"Jock, when ye hae naething else to do, ye may be aye sticking in a tree; it will be growing, Jock, when ye're sleeping. My father tauld me sae, forty years sin,' but I ne'er fand time to mind him."

The Influence of Science and Capital, Railroads and Manufactures, on Agriculture.

[*Extracts from an Address by* E. H. Derby, Esq., *at the last Fair of the Middlesex Society of Husbandmen and Manufacturers.*]

In estimating the importance of science and capital to agriculture, we learn, from the lessons of experience, that a fertile soil alone does not carry agriculture to perfection. Should we seek the spots where agriculture gives the largest and most remunerative returns for a given space, we should find them, not on the fertile banks of the Nile or Ganges, the rich plains and valleys of Sicily, or the prairies of the West, where a virgin soil and low prices attract so many youthful cultivators. You must look

to Flanders and Holland. There, science and capital combined, in a harsh climate, have rescued vast wastes from the ocean, and converted sterile marshes and barren sands into productive fields, the very garden of Europe. Or, look at England, where the same powerful combination has transformed the sandy plains of Norfolk, for centuries abandoned to the rabbit, into luxuriant fields of wheat, clover, and turnips, and changed the fens of Lincolnshire, which encircle the old town of Boston—fens for centuries the resort of wild ducks, geese, and other birds of passage—into the granary of England!

The achievements of science and capital, in the agriculture of the old world, lead us to appreciate aright their value on this side of the Atlantic, and to take a more correct view of their importance and uses. A few rash experiments here, guided by no practical skill, may have led some to distrust theories, and the value of book-learning; others have looked with a jaundiced eye on the accumulation of wealth, have regarded its votaries merely as a mercenary race, a class useless to the community, instead of viewing them as stewards, accumulating property for the benefit of society; forgetful that their wealth, whether invested in banks, ships, docks, or avenues of trade, or in loans upon land, is giving an impulse to the whole country.

To insure the progress of agriculture, it is for science to indicate the path; to suggest the elements of the soil; to point out its deficiencies, and the appropriate remedy; to present the improvements in tools, fences, and buildings, and the discoveries of art; but in vain would she place her finger upon these, unless her ally,—capital,—should follow, and furnish the stocks, tools, structures, and fertilizing substances, and aid in creating avenues from the farm to the market.

There was a time, but a few years since, when the credit of our state and country, now so elevated, was deeply depressed; when the bonds of Massachusetts found no purchasers. Science had planned that great avenue which makes Boston one of the seaports of the West; but means were wanting. By whom, think you, were they furnished? By those unfortunate Irishmen who seek here a refuge from bad laws and national calamities, who toil upon our public works, and to whom we owe all

our canals, wharves, and railroads. The quiet accumulations of these small capitalists, in the Savings Bank of Boston, absorbed more than half a million of our bonds, and finished the Western Railroad.

At the commencement of the railroad system, in New England, some fears were entertained that the effect might be injurious to the farms which encircle our metropolis. This opinion was countenanced, for a brief period, by the competition of the new milk-farms along the line of the Boston and Worcester Railroad with the dairies in the suburbs, and by the depression of agricultural products, through the country, which followed the commercial revulsion of 1837.

Doubtless, some changes were effected; but have not the suburban dairy-farms been required for building-lots at treble prices? Are not the streets of the metropolis extended far into the country, on seven great lines; and is not land sold by the foot more than ten miles distant from the Merchants Exchange of Boston? And are not farms, once supposed to be ruined by the location of railroads, like the Winship and Hunnewell estates in Brighton and Newton, at least quadrupled in their value? Have they not shown that the railroad is, by no means, the road to ruin? Do not milk, butter, corn, oats, pork, beef, command remunerating prices, the latter in particular, and when you cannot buy a sirloin in the Quincy market under a shilling a pound? If occasionally, produce from the interior competes, in our market, with that of farms in the vicinity, does it effect more than a change of use, or of the course of cultivation, and does not the increased size of the market draw in the market-wagon from a larger circle? Or, if any temporary depression occurs, are not farms, in the outskirts of the counties around Boston, more elevated than the adjacent farms are depressed?

What would be the position of the farms around Boston today, if our railroads and inland marts had no existence; were we to banish the hundred millions of wealth, and the one hundred thousand people which have accumulated in and around it since the first movement in railroads, and send them to New York and New Orleans, where they would have been planted if such movement had not been made?

Do the one million of tons, moved annually by the railroads out of Boston, doubling once in four years, give no impulse to industry in and around the city; or do these great works of melioration, which bear industry—the only marketable commodity of the poor man—to the best theatre for its exercise, give no increased value to industry itself?

Does not every house, erected in and around the city, and every ship added to its rolls, require nearly an acre of land to supply its immediate demands, and is not every such house and ship a market? And are not every drain, vault, and chimney, a source of fertility? Are, or are not, the effects which attend the progress of the railroads of Massachusetts, injurious or beneficial to the county of Middlesex, and what are its position and prospects with reference to agriculture?*

Our county embraces an area of eight hundred square miles, and its population, rapidly increasing since the census of 1840, may now be safely estimated at 120,000, or one hundred and fifty to the square mile. In manufactures, it annually produces *twenty-three millions of dollars;* and is, in this great department of industry, the leading county of the state and of the Union. The annual products and manufactures in this single county, are more than double the average exportation of bread-stuffs from the whole Union, and would pay for more than a moiety of all the flour, grain, and corn exported during the season of famine. Rapid as has been the improvement of agriculture, and wide as has been its expansion in new counties and states during the last twenty years, the advance of manufactures has been quite as rapid; and if there be truth in the remark of a great British statesman, that every loom stopped in England stops a dozen ploughs, how many American ploughs have the looms of Middlesex set in motion?

The combined effect of manufactures and railroads, has been

* The effect of railroads, thus far, appears to be, to meliorate the condition of those residing at a distance from seaports, and to elevate the value of their farms and products, without depressing property nearer to the great markets. The increased resources of the interior are illustrated by the fact that, in August last, nearly three millions were subscribed in the country for a short railroad from Manchester to Lawrence, while it took nearly twenty years, half a century since, to raise three quarters of a million to construct the Middlesex Canal.

to furnish Middlesex with numerous markets. With such markets and facilities of communication, which nearly equal those of the most prosperous districts of Europe,* and are surpassed by none in America, what are the agricultural products of the county, and how far are they capable of expansion?

Their aggregate amount, by the census of 1845, is but two millions three hundred thousand dollars, an amount large in itself, and yet but one tenth of the produce of its manufactures. And may we not safely infer from this disparity, if from no other obvious facts, that the agricultural resources of the county are not yet fully developed; and that, when developed, the markets of the county will require a vast amount of products not raised within its limits, and furnish an overplus of clothing and other manufactures which may with advantage be applied to their purchase?

If we scan the agricultural returns of Middlesex, for the year 1845, we find its stock as follows:

34,728 head of cattle, or 43 to the square mile.
9,776 " horses, or 12 " "
4,428 " sheep, or 6 " "

Let us contrast these returns with those from England and Wales. This highly cultivated country exhibits, in an area of less than sixty thousand square miles,

4,000,000 cattle, or 67 to the square mile.
1,500,000 horses, or 25 " "
26,000,000 sheep, or 450 " "

* Prices in markets of Boston, Mass., and Liverpool, England, in 1847, in American currency.

	Boston, October 16,	*Liverpool, September* 11.
Beef,	6 to 15 cents.	12 to 16 cents.
Mutton,	8 to 14 "	12 to 15 "
Fresh Butter,	18 to 28 "	28 to 30 "
Fowls, per pair,	75 to 125 "	72 to 84 "
Turkeys, each,	110 to 125 "	108
Potatoes, per bushel,	70 to 80 "	48 to 56 for 60 lbs.
Old Hay, for 100 lbs.,		85 to 100 "
New Do, " "	75 to 85 "	70 to 85 "
Salmon, per pound,		20 to 24 "
Eggs, per dozen,	17 to 18 "	14 to 16 "

If we reduce these to one standard, it must be apparent that Middlesex, with all her improvements, does not sustain one half the amount of stock, to the square mile, which is reared by England and Wales. And may we not safely infer, that our county is competent, under improved husbandry, to double or treble its stock of animals?

What are the cereal and vegetable products of Middlesex? The statistics of 1845 apprise us, that it produces, in round numbers,

427,000 bushels of corn and grain, worth -	$264 000
2,174,000 " of esculent vegetables and fruit -	554 000
78,000 tons of hay, - - - - - -	777 000
Milk, valued at - - - - - - -	153 000
Butter, - - - - - - - - -	163 000
Cheese, eggs, poultry, honey, berries, &c., - -	34 000
Stock sold, estimated, as in England, at one fourth of the whole, - - - - - - - -	216 000
Wood and charcoal, products of forests, - -	187 000
	$2,348 000

May we not anticipate, from improved husbandry, the increase of cattle, and consequent growth of manures, a large increase in the amount of some of these productions?

The tables to which I have adverted, gleaned with much care from the statistics of 1845, are fraught with interest to the farmer of Middlesex. Let us glance at some of the varied lessons which they teach him:—

First. That the principal products of his industry, vegetables, fruit, hay, milk, and fuel, or nearly three fourths of the whole, are of such perishable or bulky character, as not to admit of easy transportation to his market-towns from the remote interior. His close vicinity to the market enables him to supply it with the least cost, to avail himself of the highest prices, and to carry back to his farm a return-load of enriching substances, while the farmer of the remote interior would find his profits in a great measure absorbed in the cost of the compressing of hay, the deterioration of milk and vegetables, and the increased expenses of conveying all to market.

Second. These tables teach us that Nature has peculiarly adapted this county for those bulky products which are most appropriate for its position. While it is prolific in fruits, roots, fuel, grass, and milk, its supplies of grain, corn, pork, wool, butter, and cheese, (which admit of transportation from a distance, for the product of acres may be compressed into a single car,) are moderate in the extreme. Middlesex plies at least 400,000 spindles. She raises not one pound of cotton. Her 4,428 sheep would not supply her spindles with wool for a day, nor furnish her population with one annual dinner of lamb, and another of mutton. Her sheep, too, are annually diminishing, giving place to milch cows and cultivation, and she must depend on the interior for both wool and mutton, both indispensable to her comfort and prosperity.

Third. With respect to bread-stuffs, Middlesex produces annually but 427,000 bushels of wheat, corn, rye, oats, barley, and buckwheat—not one third enough to supply her own population, to say nothing of her adjacent markets. Her whole annual production will barely suffice to give each *horse* in the county half a peck of corn per day for his sustenance, and no generous or judicious farmer can think of allowing less. Her annual wheat crop, but 1,952 bushels, would provide but one treat of dough-nuts for the good people of the county, and all the pork we can afford to raise will scarcely suffice to fry them, and to dress those fresh cod-fish, mackerel and halibut, which Providence has placed around our shores, but denied to the prolific regions of the West. For pork and bread-stuffs, and I may add for butter and cheese, as the railroads are converting all Middlesex into a milk-farm, the county is dependent on the remote interior.

Let us glance for a moment at a single county of the West, about two thirds the size of this. The county of Genesee, N. Y., by the census of 1840, exhibits 1,940,000 bushels grain and corn, 154,000 sheep, and 49,000 swine. As a Middlesex farmer, I see nothing to regret in this excess, or to tempt me to exchange my acres in Middlesex for as many or more in Genesee. Nature has bestowed different blessings on different sections of the Union. If, at the West, she has placed her layers of limestone

beneath a fertile soil, and adapted it to wheat and corn, or spread her beech-nut forests over the hills, to furnish mast for the swine, and created pastures congenial to the sheep, she has placed us near the ocean, the great highway of nations; she has shaped out ports and harbors for commerce, rivers to impel spindles, has clad our rocky hills with forests suitable for timber or fuel; and if she has planted boulders in our fields, a market exists for them in the wells, cellars and walls of our growing towns and cities; she has given us land, which enlightened industry will adapt to our position, and endued us, I trust, with sufficient energy to make it available.

Within the last twenty years, agriculture has made great advances in this county: meadows have been reclaimed; drains have been opened; beautiful orchards have been planted; tasteful cottages, improved houses and barns, have been constructed; the races of animals have been improved; the sources of fertility have been guarded; land more highly cultivated; and the society I have the honor to address has, no doubt, contributed to the progress of agriculture.

But why should not further and more rapid progress be made, and why should not Middlesex present as bright an aspect as the most productive counties of England? Why should we not become the pattern county in agriculture, as well as manufactures? We have markets for our produce nearly, if not quite, equal to those of England. The price of hay, straw, milk and vegetables here, is quite as high as the average prices of England. In Indian corn, with its masses of fodder, which will not ripen in England, we have decided advantages. In the apple, congenial to our soil, but which does not attain perfection in England, we are also before her. In addition to all this, every frugal and industrious man may here own his farm in fee, is free from the burthen of feudal tenures, from oppressive taxes and poor-rates, and may worship God, educate his children, and vote according to his conscience,—a privilege not always accorded to the English tenant.

But while the farmer of Middlesex enjoys these advantages and incentives to exertion, does not much still remain for him to accomplish? Do we not occasionally see half-tilled fields,

where the plough has barely skimmed over the surface, and little or no aid has been given to Nature? Does not the waving grain, by its light and unfilled heads, sometimes indicate the deficiencies of the sower? Do not some mowing fields, brown with their unprofitable herbage, and chequered with white weed, mourn the absence of plaster, compost, or ashes? And when we reflect that a single acre of enriched pasture is competent to maintain a cow, is not our sympathy often excited for that useful and most respectable animal, as well as for her neglectful owner, when we see her threading her weary way through barren acres, where not a single blossom of white clover perfumes the air, now roving through alder swamps, now climbing hills covered with birches or brambles, at times lost amongst the thicket, and recognized only by the tinkling bell?

Again; let me ask, is not the county studded with deep meadows and swamps, where the leaves and decaying vegetables, swept down from the hills and plains by rain, have accumulated for centuries; where the sounding-rod discovers the trunks of trees at the depth of twenty or thirty feet below the surface? Are not these mines of vegetable mould for enriching the upland? May they not be converted into luxuriant grass-fields and pastures, almost insensible to drought, and enduring in their fertility?

Are there not rocky hills, which have been wastefully denuded of wood, unfit for cultivation, where the forest should again be tempted to rise; since it flourishes among ledges and rocks, twining its roots around them, and drawing potash from the decomposing granite? Would not such transition, from a waste of rocks to wood-crowned eminences, embellish the county, as well as provide timber and fuel? Is not the importance of this apparent, when we consider the inducements offered by groves for country-seats, and remember the high prices of ship-timber, during a season in which a single white oak, of Middlesex, has produced one hundred dollars for timber? Neither must we forget that the locomotives, which will traverse the county when the railroads which are now chartered are finished, will require the annual produce of at least forty thousand acres of forest.

May not our nurseries and orchards be extended, and new varieties of fruits be introduced, and all our lands be more highly cultivated, with increased profit to the husbandman? Are not the sewers and drains of our towns often suffered to run to waste, when thousands of acres might be fertilized by their contents; and are not hundreds of tons of oil-cake, bones and ashes, annually shipped from the county, to enrich distant shores, which could be used profitably at home? These are questions which demand the consideration of the Middlesex farmer.

If he can solve these questions aright; if he can justly appreciate and avail himself of his position; if he will endeavor to improve it, instead of complaining of the competition of those who can best furnish what he cannot well supply; if he possesses that generous spirit which delights to see others prosper, while he prospers himself, a Middlesex farm offers a suitable field for his exertions.

Fallacies in regard to Labor, and Drains on Labor.

[*Extracts from an Address by* Hon. David Henshaw, *at the last Fair of the Worcester County Agricultural Society.*]

Great fallacies have, at different periods of the world's history, pervaded the public mind upon various subjects. Among the most marked of the present day is, perhaps, that which seems to have been cherished, and probably is yet by a very large number of respectable, intelligent persons, in regard to labor. Labor seems to have been looked upon by this class of persons, in theory at least, as the object of life, instead of its means and condition. Practically, however, in most cases, they repudiate their own apparent theory, by using various means to avoid labor.

Labor in itself is an evil. It is the sentence pronounced on man for his primeval disobedience. "In the sweat of thy face shalt thou eat bread," is the sentence as recorded in Holy Writ. Labor is not then the object, but the means and condition, of

life; and man rarely voluntarily labors but for this purpose. Abundance is the object of life, abundance of the good things of this world; and labor the means which the Creator has vouchsafed to us, painful and irksome indeed, to obtain that abundance. We all practically look upon labor as an evil, and we are always contriving means by which to avoid it. For this object, we avail ourselves of the natural forces to avoid it. For this object we avail ourselves of the natural forces of the elements, of the fructifying influence of climate. The intellect is racked in contriving and constructing curious machines to enable us to reach the largest reward for the least labor—which shall give the greatest result with the least effort.

Steam, that grand and wonderful discovery of modern times, that mighty power both on the land and on the wave, is made eminently effective for this purpose; and should human intellect, should man's mind enable him—as perhaps in time it may—to subdue and control the elastic gases, for labor-saving purposes, as he has subdued and controlled steam, that power will rise as superior to steam, as steam is superior to mere animal power. The saving of labor in the cost of transportation, and the saving of time, a part of that cost, on the land and on the ocean, on the rivers and on the roads, by the application of steam, great as they are known to be, fall short of the saving of labor by this power in other departments of human industry. Steam drives our factories, saws our timber, drains our mines, raises the coal and minerals, shapes the iron; in fine, it relieves man, in a great degree, to a good extent, from a portion of the evils of labor, and enables him to reach more readily and rapidly the goal he has in view—abundance, with little effort. All the inventions, all the labor-saving machines, ever contrived by the art of man, have had this sole purpose in view—to obtain abundance with little labor.

With the like design, man uses the gifts of the Creator. The rushing waterfall, and the balmy breeze, are made to diminish his toil; and climate, the variety of climate with which a beneficent Deity has diversified the earth, from the torrid to the frigid zone, is made subservient to this purpose, both directly and through the medium of exchange. If, then, abundance be

the object of our toil; if we seek to avoid labor as an evil; if we endeavor to produce a large amount of the good things of this life, by availing ourselves of the known forces of nature, bestowed without cost by the bounty of Providence; if we seek this end by the diffusion of knowledge,—the purpose for which we are here assembled,—by the invention of curious and complicated machinery; if abundance be the object of our pursuit, the purpose of our exertions; and if, in reaching this practical conclusion, we use every means in our power for overcoming natural obstacles to produce the greatest result with the least effort,—with the smallest amount of labor,—we should be careful to allow no artificial rules, no mere social, legal regulations, to defeat this purpose, or obstruct us in this pursuit.

Statutory regulations, defining the business we may follow, the mode in which it may be conducted, and controlling the channels of exchange, are but fallacious expedients for augmenting our producing capabilities. The laborer is not aided by shackling his limbs; and freedom in selecting and in pursuing our vocations seems as important to success as freedom in the personal exertions of the laborer. Abundance being the object of man's toil, he ought to be left as free to procure that abundance, by exchanging the articles which he can more easily and cheaply produce than can be done by his fellow, for the more easily and cheaply produced articles of other kinds, by other people and in other countries, as he is here left free in the choice of his calling, and in the application of his labor.

If the tropical fruits can be procured here cheaper in exchange for our ice, the natural product of our winter climate, than they could by raising them in a hothouse by artificial heat; and if the people of the Tropics could get a larger supply of ice by exchanging their fruits, produced by natural heat and without labor for it, than they could obtain by the same amount of labor in making ice by chemical refrigeration, why should legal obstacles be placed in the way of this exchange? Why should artificial bars close this road to abundance; and, above all, why cherish the fallacy that such obstacles protect labor and benefit producers? The purpose of all our social regulations is or should be to secure abundance; but were the object to protect labor, it

would be fallacious to attempt to protect it by restraining its freedom, or by loading it with taxes.

The American Union presents the best practical illustration to be found on a large scale, in the history of the world, of the benefits, from freedom in business pursuits, in labor and trade, in producing abundance. From the hyperborean borders of Maine to the spicy groves of Texas; from the frozen coasts of our upper lakes to the burning sands of Florida; from the genial shores of the distant and broad Pacific to our immediate Atlantic borders; over this wide expanse of the earth's surface, embracing different climates, various soils, and diversified resources, our citizens are left free in choosing their industrial pursuits, and generally untrammelled by duties and restrictions in exchanging with one another, for the purpose of increasing their abundance, the varied products of their lands and their labor. This entire freedom in selecting the channels of industry, this unshackled system of trade and commerce, is a primary cause of the universal and unrivalled prosperity which has marked the progress of this people during the period of their national existence.

If, then, the object of our labor be abundance, if it be to place abundance within our reach, it becomes as important to husband our resources, as to increase our productions. The great and good Dr. Franklin, one of the best thinkers in the world, among the earliest and best writers on political economy, and perhaps the wisest of mankind, exceeding every one in plain, practical common sense, tells us, that a penny saved, is as good as a penny earned. Hence the value of economy, as well as of industry. It would be labor lost to produce, and waste what we produce; and it would be vexation to find the fruits of our labor drawn from us by insidious means, through hidden channels. While we keep watch over all our personal expenses, we study less into the effects of our social institutions upon our personal resources and relations, than their importance demands, or prudence requires.

It seems quite apparent then, that, as labor alone produces wealth, so labor only can yield it; and that hence all the expenses of society are drawn from the earnings of labor. It would

seem not more certain that the earth supplies the clouds with rain, however inperceptible the evaporation, than that the maintenance of the whole social fabric, in all its forms and branches, is derived from the earnings of the wealth-producing classes, however hidden and imperceptible the channels through which the supply flows. The wealth-producing classes, hence, have vital interests at stake in our social organization, and particularly ought they to scrutinize those systems which draw their support silently and secretly, by insidious and indirect taxation, from the earnings of labor.

The sums required for the support of our municipal corporations, our towns and counties, are raised directly from the people; the amount is distinctly stated; and when it is paid, we see and know how, when, and for what purpose, it has been expended. Indeed, we know beforehand, and before we authorize the amount to be levied, the purpose for which it is wanted. But the latent drains upon the earnings of labor are more copious than by direct taxation, while we remain ignorant of the exact amount, and are uninformed how the money is expended.

Among the objects especially deserving an examination, as bearing heavily upon the wealth-producing classes, and perhaps in all their consequences, immediate and remote, the most important, are, the various charitable endowed institutions, embracing the colleges and higher incorporated seminaries, the churches, and the larger hospitals.

Basing our institutions, in theory at least, upon the idea that all men naturally possess equal rights, our laws are supposed to be framed to secure, so far as their influence extends, equal enjoyments to all. In the spirit of this policy, the law prohibits the perpetual and unlimited accumulation of property in families by entailment. The law of primogeniture has been abrogated, and estates, on the decease of the owner, where persons inherit, are divided, and seek their level in the general mass of property. This precaution has been considered necessary to maintain the desired equality of possession and enjoyment, so far as individuals and families are concerned, though families die off, and races become extinct. While we have thus guarded against accumulation of property in this manner, the law has created artificial existences,

endowed with perpetual life, and with the capacity of unlimited accumulation, in many of the corporations of which I am speaking. The income which supports these institutions, however latent and imperceptible the channel through which it flows, is drawn, in its original source, from the earnings of labor. Much of this income, without doubt, is devoted to useful purposes, but much is worse than wasted, so far as the producing classes are concerned, by creating an excess in the non-producing classes, to live on the producers. The practical tendency of these higher seminaries, as they are now constituted, supported, and conducted, seems to be to increase to an undesirable extent the professional and non-producing classes. In these remarks, it is not intended to disparage the learned professions. In the refined and complicated relations of society of this age, the professional pursuits seem a necessary part of the social machinery, and the labor of the mere literary man is no doubt beneficial in refining the public taste; in acquiring and diffusing general knowledge. The evil most heavily felt, is from an excess of the professional and non-producing classes, who are not only educated, but must be supported, from the earnings of the wealth-producing portions of the community.

Man is the creature of circumstances, and is often compelled, against his better judgment, to yield to the influences which surround him. Replace the individual members of these professions with others of the community, and the result would not be materially different. Man, under like circumstances, acts alike; and to change his actions, you must change the systems which influence and control him. The learned professions, in themselves, are not objectionable, but needful, in the present condition of society; but the systems which entice too many into these classes, and thus, as it were, force them to live on abuses, require a rigid revision. In doing this, there can be no desire or design to suppress the higher seminaries of learning; no wish to close your asylums and hospitals; no purpose to overturn your churches; but to reform and make more useful institutions, in themselves good, but which are now, it is believed, sustained, to a greater or less extent, by a needless, excessive and unprofitable drain from labor. With a less number in the

learned professions, the members would be better supported than they now are, the public would be better served, and labor would be less taxed. The producer, and the non-producer, are both victims to the existing systems.

The great leading principle of our institutions, is to equalize the benefits and enjoyments of society among all its members, so far as the acts and influences of the government are concerned; and while all that is valuable in the higher seminaries and public charities is retained and made more useful, the common schools, those fountains from which the masses draw their mental aliment, receive their mental culture, deserve your especial attention. They should be improved, their character as seminaries elevated, and the standard of instruction raised. In this way that equality of condition and enjoyment, the legitimate purpose of social government, will be best secured. In this way, too, the wealth-producing classes, the sons and daughters of toil, will be better prepared to apply their labor with intelligence, better able to judge of the workings of the social system, and can more readily and easily reach the object of their exertions—abundance, abundance of the good things of this life, of the good things in its enlarged and comprehensive meaning.

The Mind and the Soil to be Improved.

[*Extract from an Address by* Joshua R. Lawton Esq., *at the last Fair of the Berkshire Agricultural Society.*]

We are accustomed to hear much of the excellence and respectability of the farmer's occupation; of the collective power and influence of the agricultural classes of society; and such ideas are always pleasing, and, to a certain extent, are true and reasonable. But certainly they should never blind our eyes to the necessity of continual improvements, nor to the actual defects which exist in our modes of cultivation and management of our farms and property. We should never be afraid to view our condition and circumstances in the light of truth, for such

views alone will induce us to apply the appropriate remedies, and carry forward a general improvement.

We find some instances of highly successful farmers, whose fields and crops illustrate most clearly the advantages of applying science to their cultivation; but we still find, in their neighborhood and in striking contrast with them, other farms, whose appearance proves that their owners have taken no pains to avail themselves of the progress of agricultural science. It is true, there is such a thing as poor and unprofitable book-farming. If a man, with no practical experience in farming, who has been brought up in other business, should come into the country and purchase a farm, and, despising the habits, experience, and practical knowledge of his farming neighbors, should undertake to carry on a farm by the directions contained in books and agricultural papers, he would soon find his business discouraging and unprofitable. But this by no means proves that accurate knowledge, derived from experiments and experimental science, is of no use to the practical farmer.

The intelligent farmer, in perusing agricultural papers, and treatises upon agricultural subjects, will bring them to the test of his own practical good sense and practical knowledge, and sift out and apply that knowledge which may be sound and useful, and applicable to his own soils and his own circumstances, and reject the remainder. In the present state of the world, it is certainly as absurd and injudicious to reject all agricultural reading, as it is blindly to follow the rules and observations laid down in books and agricultural papers. In agriculture, as in all other occupations, we must pay a proper regard to the spirit and improvements of the age in which we live, or our agricultural occupations, and those who are employed in them, will fail in securing the respect and consideration they deserve

It must be admitted that there are defects in the modes in which farming is carried on among us; and are we not intelligent and candid enough to seek and apply the proper remedies? Why is it that our young men, and young women too, so often express a dissatisfaction with their home employments and condition? Is not the reason, at least in part, to be found in our own course of life? How can their fathers expect that their

occupations will be satisfactory and attractive, if, disdaining the help of science, and regarding whatever is new in practice as innovating on good old habits, they go on through a fixed dull round of listless toil, from year to year, barely supporting existence, unimproved and unimproving, doing nothing to relieve agriculture of associations of toil and servitude which were heaped upon it by the Vandals and the Goths of the barbarous ages? * The moral estimate placed upon the profession of the farmer is not yet sufficiently high, and whether it shall ever become so, depends upon himself, and upon the moral and intellectual cultivation which he brings to his profession. It is not yet fully understood, that it is not the whole of a farmer's duty to labor, but that his occupation is a sphere for the noblest exercise of taste and intellect, in which art and science may work with materials as exhaustless as the resources of the globe. Let him call this art and science to his aid, and man, not alone the geologist and the chemist, but *man*, the *intelligent farmer*, may look upon himself and his calling with pride, and with profound gratitude to the Author of his being and the Creator of the world in which he lives.

To render the earth in the greatest degree tributary to the uses of man; so to mix and manage its elements, as to make it teem with vegetation in all its useful varieties, is a great natural problem, vital to the existence and progress of society. To solve this problem seems not to have been among the attainments of ancient nations. With them, and indeed until times quite modern, agriculture seems rather to have exhausted the powers of the fertile portions of the earth's surface, than to

* Let us look, for a moment, at the immense importance of the agricultural interest; at the immense capital employed in tillage, and the enormous amount of its products. Take the fact, for instance, that the whole foreign commerce of Great Britain is actually worth less than the annual grass-crop upon her home island, and that the united commercial and manufacturing industry of the entire world fails to create values at all comparable with those of agriculture. These things are not sufficiently realized by the farmer, and especially by the young farmer.

Look for a moment at the power of agriculture, as exhibited the present year. What else could have snatched from the grave the millions dying by famine in another hemisphere? All the gold, and silver, and precious stones, and books of learning, in the world, could not have saved life in that crisis. The famishing millions cried for bread, and bread alone would save them; and agriculture alone would furnish bread.

have renovated exhausted lands, or to have sought out appliances and means to make poor and barren soils productive. This field is open to the industry and science of modern farming. Great progress in some countries, and in some parts of this country, has been made in it; but there is room and increasing necessity for still greater progress. What a gift from the great Author of our existence, that man is made the great instrument in disposing the earth in such a manner as to produce. Look at it as it illustrates the scientific dignity belonging to your profession. See what an elevated position you have taken in the world, to be a producer of all the good things which man can desire to make him happy, and also the provider for "the cattle upon a thousand hills." Labor is, and in the best ages ever has been, honorable.

Yet it is to be observed, that in this age of the world, when all other occupations and professions are invoking the aids of scientific research, the labor of agriculture, to maintain its dignity and respectability, must be coupled with intellectual activity and scientific investigation. The occupation of the mind is entirely consistent with industrious bodily labor. The farmer, of all others, may reasonably expect to enjoy that greatest of all earthly blessings, "a sound mind in a sound body." The occupation of the mind is productive of refinement. From it spring morality and religion; and the farmer can never be considered fitted for his business, and prepared to fill the many important positions to which he may be called in life, without much study and reflection.

The practical farmer may and should be continually improving his mind by study and reflection;—reading and study in his leisure hours, reflection and observation in his daily toil. The field of his labor is unbounded, and his mind should be continually employed in searching out the nature of his soils, and what they require to make them productive. If a piece of land is wet, how shall it be drained and made productive, at a reasonable expense? If it is cold, with what shall it be mingled, to give it genial warmth? If the soil is light and thin, how shall it be deepened and made more stringent? If dry and porous, what retentive mixture will give the power of retaining

moisture and manures? These are questions to be solved by every farmer, in regard to his own fields, and they must be, to make him a successful agriculturist.

First, he must learn the general character of his soils; the general classes to which they belong, the proper treatment of these classes of soils; and then he must patiently ascertain, by trial and experiment, the peculiar modifications of that treatment which his particular soil may require. By so doing, by this practical application of his knowledge, he can enliven dead and unproductive lands, and make them teem with the choicest productions of the earth. He can, in short, give to soils just such a combination as he pleases, and can make a good soil where nature has denied it both mechanically and chemically, by adding earths, and by adding manures. Different soils require different treatment, to dispose them to production. The intelligent practical farmer knows lands when he sees them; he knows what treatment they want. His common sense and observation will teach him how they may be made productive. He is many times surprised, when he sees sterile and unproductive fields very near flourishing villages, where lie most of the materials, necessary to enrich them, unemployed. A few shillings and dollars, with some labor and energy, will prepare the fossil manures, and apply them to produce fertility. The limestone beds are reposing all around, waiting for the attention of the owner, or the capital of some one who deals in stocks, to bring them to the furnace, and prepare them to correct and fertilize the soil, making those sterile fields not only productive, but ornamental.

There may be, and there are, portions of our land, where the soil is itself so rich and inexhaustible in fertility, that a knowledge of making an application of manures is of no consequence. But we all know that our soils generally are not of that character. Here the science of preparing manures lies at the very foundation of agricultural success. The variety of manures is much greater, and their application to the variety of soils and crops is much better understood, than heretofore. The farmer has learned much by his own experience, by his own experiments, patiently and perseveringly carried out, modified by his own good sense

and careful observation. He is no longer content with the small amount of manures which his farm naturally supplies. Nature, at home and abroad, furnishes manures, and the materials from which manures can be made, in almost endless variety; and if the farmer is diligent in inquiry and experiment, he can create, in his barn-yard and compost-heap, a bank, from which he can draw at pleasure, and without an endorser; for the manure-yard, the compost-heap, is the farmer's bank, it is his mine of wealth, and, without it, he is poor indeed.

But, besides all that the farmer can learn upon this subject from his practical experience, he can undoubtedly derive great assistance from chemical science, and to this he should by no means shut his eyes. If he would elevate his profession, if he would ensure to his labor the reward of wealth and competence, he must make the discoveries of science tributary to it. The true course of the farmer is, not to spend his time in complaining of the advantages which knowledge and science give to other pursuits, but rather to make knowledge and science subservient to his profession. Instead of decrying the importance of these, let us use them for our own purposes. Let us use them with good sense, care, and economy. We see the vapor fall in rain, and vegetation receiving it and rejoicing. The winds of heaven are continually passing over our fields, and the air is purified and made the proper food for vegetable life. The sun is continually warming and urging the plant to grow; it also gives its light, that it may mature. The air carries with it oxygen to the seed, that causes it to germinate; and furnishes to the leaves, the lungs of the plant, carbon, without which the plant must cease to be. These are facts well understood by the farmer. But should he stop here? Should he rest content with but this amount of knowledge, which nature has vouchsafed to him almost unasked for? Surely not, if he would be master of his profession, and maintain that professional dignity which becomes him. He should call to his aid the knowledge of scientific men, and by this, learn to mix and manage the elements of earth and air with more than magic skill. He should take care that the mechanical and manufacturing arts do not enjoy all the benefits of the discoveries of chemical science. He should

claim, for agriculture, its just proportion. In his experiments, especially upon the subject of manures, he can thus make much greater progress, and attain much more important results.

The discoveries of scientific men are of no use, until practically applied, and tested by practical farmers. And who are to test and apply them, if we are not? How shall all these mixtures be applied? What does each particular soil require? Shall they be applied in a fermented or in an unfermented state? On the surface or turned under? Put on, as a top-dressing, in spring or in autumn? What particular dressing does each particular crop require? These are questions involving the laws of nature, the principles of art, and careful experimental labor and observation in the compost-heap, and in the field. Our vocation is, to render the earth productive. One great and important agent in production, is manure. Its abundant production, and its economical application, require the combination of scientific knowledge, and practical industry. Science is doing her part: let agriculture be ever ready to do hers. The farmer is never too old to learn, until he is too old to labor.

Those who succeed well in any business or profession are usually found to conduct their business with system, order, and neatness. System, order, and neatness, should ever be the study of the farmer. When the fields of the farmer are found to be badly laid out, bordered with hedge-rows; his fences crooked and half down; the stable for every thing, and not fit for any thing; the outbuildings awkwardly situated, with few or no conveniences; his stock one third more than can be made comfortable, and be kept in a thrifty and growing state upon his farm; his tools and implements of husbandry left some in one place and some in another, scattered over his farm, and many of them unfit for use; surely the want of success of such a farmer needs no explanation. These appearances fully explain it. They show why he has been kept poor when he should have been made rich. Let our young farmers, then, when they begin life for themselves, study system, order, and a continual regard for practical convenience, and their industry will be sure to meet its just reward.

The effects of system, order, and care, appear to striking ad-

vantage in the rearing and management of domestic animals. The ox, the cow, the horse, sheep and swine, are animals of practical use, and some of them are parties with us in the labors of the field. It is but a part of civilization and Christianity to treat them with kindness and humanity. But more than this can be done, as the experience of many members of this society attests, and as its annual shows have abundantly proved. What a wonderful triumph of human reason and power, that the animals, given and subjected to man by the great Author of agriculture, can be moulded and fashioned to his liking, as the clay is fashioned by the potter. Form and figure, size and power of bone and muscle, adaptedness to the peculiar service required, kindness and docility of disposition, and even agreeable countenance and expression, by patient and skilful breeding, can be successfully attained. What can be asked more? Modern discoveries are said to enable the farmer to decide, with unerring certainty, which of his heifer calves should be raised for the dairy, and which should be prepared for the shambles; and this by marks and indications readily perceived by the common observer. Comparison of knowledge and experience has done much in the improvement of our stock of animals, particularly of neat cattle. In this improvement, as well as in that of other stock, the generous competition, produced by the encouragement of this and other agricultural societies, has greatly aided.

The Study of the Natural Sciences important to the Farmer.

[*Extracts from an Address at the last Fair of the Plymouth County Agricultural Society, by* John Lewis Russell, *Professor of Botany and Vegetable Physiology to the Massachusetts Horticultural Society, &c. &c.*]

All branches of human knowledge seem to have some common alliance; but, in no occupation in which mankind have engaged, does there seem to be such a necessary connection of varied and multiplex subjects, as in Agriculture. Hence, I may urge on your attention the further consideration of the subject of education, of the general diffusion of useful know-

ledge, and of the necessity of the study of the natural sciences. I am persuaded that the time will come when this branch of industry will be regarded in the same light as the learned professions; and that it will hold its rank among them, for equal respect and honor. But, before this can occur, it will be necessary to develope its connection and harmony with the deeper and more recondite studies of the laws of matter. I know that there is a prejudice, founded on some very good sense, against what is commonly called book-farming; the good sense of the objection lies in the fact that experience is better than any theory. As a general thing, the farmer needs to be practical, if he would succeed. He cannot afford to spend his time or waste his money on doubtful experiments; for his land and its products must support him and maintain his family. Much, too, that is done by those who would be practical men, is found to be too expensive; in Yankee phrase, "'twill not pay." It is not every one, who can make a safe investment of his labor and expenditures for some very distant period when the interest will be realized. I presume, however, it will be granted, that nothing which is done to the earth, or to the more solid improvement of the farm, is really lost or wasted. It may not render a quick return; and this is what most who engage in your occupation need.

When we perceive what an undue proportion of our citizens are engaged in other pursuits and business, in mechanical occupations, in trade, in the professions of law, medicine, and divinity, and not a few, some of whom could be spared with great advantage, in the keeping, not teaching, of schools; a remark, by the way, not wholly inapplicable to the other three last-mentioned callings; when we see how there is a constant press into such occupations, it is not surprising that your vocation should be overlooked. In all these departments, rivalry and increase of competitors compel, as it were, the most constant and sedulous efforts to excel; and the mind is kept on the alert to discover some new plan, or to effect some new mode, by which greater success shall result, or by which some advance shall be made on what has been known before. In none of these, is there rest or pause; but every day heralds a new fact in science or in lit-

erature, a new and important discovery in mechanics or in trade. Were there the same, or similar competition, in the agricultural pursuits, we might, perhaps, witness similar results. But such competition will seldom or ever be seen. And yet the vast resources of the earth are scarcely known.

While the fertile and virgin soils of the West pour forth annually their thousands of bushels of wheat, and of other grain, the agricultural interests of the country tend chiefly there. The facility of transportation brings to our doors the cereal riches of distant regions, and makes the market a cheaper resource than the corn-field; but whether the more profitable one to the farmer, remains a doubt. What new tracts of land, or what yet unreclaimed forests, are destined to the plough and the harrow, we know not. There is a curse attendant on rich and exuberant soils, viz., the habits of thriftlessness which they engender—a few weeks, or a few months of labor, and the rest of the year tempting to idleness or laziness. Your occupation verifies and yet reverses—anomalous as it may seem—the primitive curse, "In the sweat of thy face shalt thou eat bread." It sweetens the food, and gives a keener relish to the viands that it procures. In an oriental country, nothing could have been truer, and no more dreaded ill could have been threatened. Indolence and ease are the envied and the almost essential condition of life in a primitive state, or under the languid air of the tropics. The most manly and noble developments are witnessed under bleaker skies, and in colder, or at least more temperate regions. Nature there calls forth new energies, and awakens exertion. A more brilliant or a clearer atmosphere seems to invigorate the physical frame. Men, like the plants and the animals of such regions, are capable of great endurance. Life is better enjoyed in all its varied functions. Observance of sobriety, and of temperance in all things, induces longevity and soundness of constitution. The tables of mortality show conclusively from what classes the diseases which ravage the population, mostly originate. The trades, the professions, the mechanic arts, shorten human life. On the contrary, your occupation seems the surety of physical and mental vigor. Nothing appears to be needed but a more intellectual grade, to invite more co-laborers into your fields.

In saying this, I by no means wish to depreciate the intellectual standing of the farmers of Massachusetts, or of my neighbors in Plymouth County. I only ask of them a deeper interest in the welfare of their calling. You are associated for mutual improvement. Your society becomes a lyceum, which holds an annual meeting where each may learn something valuable. Much more can be done. It can be shown, by science, how much more profitable the cultivation of less land is, and what are the hidden sources of wealth in even your most barren spots of earth. To this result, many of you, doubtless, have long ago arrived. The judicious application of manure on smaller portions of your farms, has proved how much better agriculture is understood now, than formerly. The several better modes of preparing the soil, the improvement in tools, the labor-saving machines, the feeding of stock, and other minutiæ familiar to you, are, in a great degree, the result of the application of science. For these, you are indebted to books; and the library which accumulates from year to year on your shelves, indicates how much your occupation is connected with the culture of the mind.

What is there needed to place agriculture among the sciences, but similar institutions to prepare its candidates for such honorable toil and enterprise? All previous action has been the following in the steps of custom, and of doing what has been done before. We have academies and colleges to educate our children to become fit for other pursuits of life; yes, even for the cruel and unnatural trade of war, a national expenditure is wasted in teaching and training. We have excellent institutions to rear, into efficient instructors for our public schools, our young men and young women; but where the State school for the instruction in that branch of human industry and skill, under whose auspices the olive-wreath of Peace buds and blooms, and which scatters untold blessings all around? The application of chemistry to manufactures, encourages new efforts in their pursuits; but where the farmer's son, who seeks to know how the feldspar of his father's granite boulders can be decomposed into efficient nutriment to the soil? The diseases which infest the grain, and which lay waste your hopes, are known and under-

stood by the naturalist; but where the schoolroom which teaches your children the hidden mysteries of the kingdom of nature, in which you have the greatest interest? I give all credit to our state for its agricultural and scientific surveys, and for setting an example to other states of the Union for more than an imitation in these particulars. The results are laudable, and praiseworthy to those who produced them; but it is nothing more than the beginning of something which is needed. Why should not the most remarkable occupation of life have its just representation in the studies of men? And what reason why your sons and daughters, besides what you can teach them, should not become proficients in those more intellectual studies, in which they must find advantage, when connected with their usual avocations?

It cannot be too strongly urged on the community to encourage a more active interest in the labors of the field. Far better would it be for many of our young men to see what they could accomplish in this department of industry, than to enter into so many futile speculations, or adopt so many other methods of acquiring a competence, for which they are but ill adapted. The fond hopes of many a parent's heart would never have been blasted, had his feeble and puny son been apprenticed to the plough, rather than suffered to prematurely die within the close and stifling walls of the college. What benefits might not our rich men confer, by spending their days of ease and of freedom from the cares of life, among the picturesque hills and green fields, instead of immuring themselves in the city to breathe its pestilential atmosphere? Wealth can command what toil cannot procure; and the few and prominent examples of such millionaires as may be found amid their sylvan retreats, exhibit in what degree nature can be made to contribute to the luxuries and refinements of life. So intimately connected is every part of society, that benefit must accrue, wherever expenditure is made; and doubtless the actual condition of the agricultural portions of England is far better, from the general taste of its nobility for agricultural pursuits, than it would be were its rich men to congregate in its cities, and to draw around them there all the elegancies and refinements of social life. It needs but

an imitation of such a spirit, and a more general cultivation of such a taste among our wealthy men, to render Massachusetts the gem of the Union in the riches of its vege-culture, as it is already the key-state in its moral and intellectual. Its most barren soils need only the application of science and enlightened labor to convert them into useful tracts; and its rugged hills may be clothed with the perpetual verdure of the pine, or with the valuable growth of other trees.

There is too much of the notion prevalent yet, that learning is injurious to labor, and therefore, to secure what will barely enable one "to get along in the world," is all that is necessary. But, beside the elements of common instruction, what a multitude of subjects every day renders it necessary for the child to learn. How much better would it be, were children, and those especially whose lives are to be spent in the country, made acquainted with the wonders and beauties of nature, which lie all around them unnoticed! How much happier would their lives become, had they been early trained to see Divine Wisdom in the natural world; how every flower, insect, bird, animal, were wisely and wonderfully made and adapted to some purpose and end; how intimately connected with their best emotions and capacities, and to the development of their affections, were the contemplations of God's works!

I can hardly imagine that any of you will ask me what this has to do with a farmer's life. If you do, let me answer that it has much; much in every way. If it have no other effect, it will have this, to elevate your occupation to the rank it ought to hold. On the farm, as well as in the study or workshop, intelligence will suggest skill and facility of execution. Indebted as agriculture is to the application of art and knowledge to its pursuits, it must needs be that the field is not exhausted, but only opened and expanded for further results. How can it be expected that agriculture will assume her stand among the professions, unless her votaries be rendered efficient in promoting the work? The intrinsic importance of any thing is slowly seen, unless there is something striking to attract notice. If you, who dwell among the grandest or else the most

beautiful of the Creator's works, are insensible to their charms, how shall others find subjects of consideration in them, who are unacquainted with their details? The agriculturist should have an enthusiasm for his labors, such as the artist, the painter, the sculptor, have for theirs. By the facilities that education secures to him, he can render the country more attractive than the city; and can show that the life he leads, while promotive of competence or even wealth, is by no means incompatible with taste, or with those pursuits which render life agreeable and human existence a blessing.

And what sources of admiration and of research, most curious and minute, there are on every side, on every hill, plain, swamp, and river; in the rocks which cover the soil, in the reeking manure-heap, in the growing and bursting grain, in the diseases which attack it, in the tiny insect, in the friendly birds, in clouds and rain and snow, in forest and glen, in the atmospheric changes, and in the succession of the seasons! He who would observe these will not urge the plea of want of time; he who does observe them, will find such observation to his profit as well as pleasure. Nothing that God has made is unworthy our study; nothing we investigate in his creatures which tends to no good result. Books and treatises on natural history and natural philosophy should be among the choicest reading of young persons residing in the country; how infinitely better than the worse than worthless trash, which a cheap periodical literature, (if it be not a profanation of the word *literature* to couple it with such productions,) deluges our times. What entertaining and instructive volumes those of Dr. Harris on the "Insects of Massachusetts injurious to Vegetation," or that later work of George B. Emerson, in his fascinating treatise on the "Forest Trees and Shrubs" of this state; a book, indeed, which ought to lie on every farmer's table in his parlor or library.

The farmer should be an ornithologist, at least so far as to know the value of those minstrels of the air which cheer him with their songs, and are far more his friends than his foes. It is not only a gratifying circumstance, but one which attests to the elevation of agriculture, to notice a better spirit annually

manifested in "sparing the birds." The methods to protect your cornfields from injury, which your ingenuity can suggest, are worthy all the time they may consume—so that while you suffer nothing in your grain, the birds also escape injury. An indiscriminate destruction of birds has always proved the short-sightedness of the practice. Countries where these little creatures are used for food, without respect to sorts or size, are proverbial for the insect vermin which abound. A perusal of some authentic work on the natural history of birds, and your own observation, would convince you of their humble but gratuitous and useful coöperation to rid your soil and grounds of grubs, worms, crawling and winged insects of every kind. The most mischievous are not wholly depraved; those plunderers of the cherry tree and the despised crows make away with a numerous and countless host of creeping things, as an offset to their love of your corn and fruit. Humanity, as well as expediency, direct to their preservation and protection.

And why should not the younger branches of the family become acquainted with the history of insects, that, familiar with its details, they may be forearmed against their attacks, when they shall turn their attention to the labors of the field? These minuter studies require sharper and younger eyes than their parents possess; otherwise, I should urge on your attention entomology, as a collateral branch of your profession. The knowledge of the natural history of insects, ought not to be confined to the very few who cultivate it as a pleasing occupation, but it should be more practical and common. The agricultural newspapers of the day are producing signal benefit in this respect, in the attention they bestow on this subject. Correct and particular descriptions of the insects injurious to vegetation, with figures of the several stages of their growth and transformations, will prove decidedly useful. Doubtless, much of the mischief which annually increases from certain kinds of insects, might be palliated, perhaps obviated, through a knowledge of their habits. The constant importation of foreign fruit trees renders us liable to the introduction of destructive foreign insects accompanying them. But, independent of the utility of the subject, it embraces a wide range of objects, full of curious interest

and salutary instruction, and serves to elevate the mind through a consideration of the exquisite workmanship, in minute relations of organized life, which emanates from the Hand Divine.

It were invidious to science, as well as unjust to the cause of truth, to speak more emphatically of one branch of knowledge of nature, than of another, in relation to agriculture. But it may be affirmed with confidence, that he whose attention is mainly directed to the production of the fruits of the earth, should be intimate with the natural history of plants. In a similar manner, and in the same proportion as he becomes the raiser of stock, should his knowledge extend to those physiological truths which are connected with breeding, and with the successful treatment of animals. The volume of nature is open indeed to every one to study and peruse; but how essential does it become, that its pages be well conned by the cultivator of the soil. The intimate union of utility, of strength, of yield, with the laws of organic life, demands the possession of whatever is known regarding animals, and yet more and constant observation. Indifference to such subjects on the one hand, or ignorance on the other, will leave one far behind, and incapacitate him from acquiring the most feasible means of increasing his substance, or receiving the full amount of what is possible in his avocation. The remarkable results in improvement here, indicate the value of such societies and associations as this before me.

But, beside the animal economist, the farmer needs to be the botanist; needs to be acquainted with the physiology of plants, with their history and science, their capacity for culture, and the like. Thus, how many errors have been committed from a want of a little knowledge of this kind! Grasses, and even worthless weeds, unsuitable in the first case, and injurious in the other, have been recommended, on the high authority of names, and proved to be decided failures. Travellers and itinerants, tourists and marvel-finders, notice with wonder the luxuriant growth of some vegetable, and this for the first time in their lives, perhaps, and inconsiderately transmit it for home cultivation. Next, the newspapers cry it up as some great discovery, and it becomes a speculation in the agricultural market.

Witness the *Gama grass, which that learned and scientific agriculturist, the late Hon. John Lowell, exposed as a coarse and poor production, unfit for our cultivation. At this moment, I have a tuft of another and a Southern grass, called the †Means grass, growing in my garden, which has been highly recommended for soiling, and which looks like something between Broom corn and ‡Cocksfoot or barn grass, and probably about as valuable for us as either. If one would have good English grasses for cultivation, he should resort to those kinds which succeed best in latitudes of the earth similar to our own. Does he need short and sweet pasturage for his cattle or sheep?—the generic and specific knowledge of the plant will indicate the kind. In some parts of Germany, Belgium, and France, the spurry (spergula arvensis) is used for soiling; it being said that all grazing animals are exceedingly fond of it, and that cows fed on it will yield one third more milk, and make one third more butter, and of a very superior quality § The same plant is an introduced and now naturalized weed in our corn fields, growing in a horizontal and spreading direction, not unlike chickweed, and belonging to the same natural family of plants. Of what value it might prove in the light sandy soils of some parts of the South, where the true grasses thrive so poorly, I am unable to say; but it may be a question relative to its importance among us. In the vicinity of Boston, the succory (chickorium intybus) grows luxuriantly, also a naturalized foreigner; a bitter herb, of which the leaves, which increase in size on cultivation, are used, in the neighborhood of Paris, France, to give to milch cows, to increase the yield of milk. There is a slight objection, however; this kind of food imparts a bitter taste to the milk. I have no means of judging how well the cows, which are pastured by the road-sides in Cambridge, relish this species of fodder, except from the luxuriance of the foliage of the plant in question, which does not seem much affected by the visits of these creatures; and I presume their better judgment would lead them to select a shorter and sweeter feed in the verdant grass, among which it grows a bold and beautiful intruder.

* Tripsacum dactyloides. † Sorghum halepense. Panicum crus galli.
§ See Hovey's Magazine of Botany and Horticulture, Vol. XII. p. 285.

The high cultivation of plants, produces great and permanent changes in their forms. The native and wild species are often either smaller, or less valuable in point of economical use. A departure from the common type may be continued by frequent raising from the seed produced by some unusual and abnormal form. In this way we have our finest pears, and the lesser fruits, such as strawberries, currants, gooseberries, &c. So, likewise, the more ordinary sorts came from the successive seedlings of some accidental variety of species with acerb or harsh juices; also many of our grasses and grain are highly improved in this way. Lately, I saw some plants of the common Dutch clover, or red clover, where four, five, and six leaflets (or leaves, as they are called) were strikingly and unusually predominant over the usual number of three. If a permanent variety could be produced, it would afford better chance that clover-hay, be not so stalky, but more abounding in leaves.

Some striking facts in the diseases of cultivated vegetables and plants, botanical research has brought to light. Absurdities and errors, like baleful ignorance, flee before the rays of truth. In the wheat districts of England, the rust, which infests the barberry bush, is believed to be connected with the rust which injures that grain. Something of the same idea prevails among some of our farmers; only I have heard the evil attributed to the dust or pollen of the flowers of the barberry, or perhaps to the odor of its blossoms! The botanist, with his microscope, has shown the fallacy of the first statement, in the indication of two distinct species of minute fungi, two distinct kinds of rust, (for the rust is a minute and organized plant) and has proved, from experiment and observation, that neither of these species can grow on any other vegetable than the one on which it is found; in other words, that the wheat-rust is one thing, and the barberry-rust is another and quite different. The absurdity of the disease of the wheat being produced as supposed in the second statement, is too apparent to an intelligent or thinking person, and scarcely needs refutation, although it shows under what distortion a tradition, or an error, is frequently transmitted. So, the sudden blight of grain, when a few hours have witnessed the devastation from a healthy state to absolute ruin, has puz-

zled and bewildered many a cultivator; yet the botanist has unriddled the mystery. The minuter fungi are curious plants. Their seeds or spores are of impalpable and imperceptible consistence, except to the deepest powers of the microscope. They are given out in myriads, and float in the air, and pervade the soil; so minute are they, that they are transmitted through the sap-vessels and wait some favorable condition of the atmosphere to develope them. This occurs when heat and dampness are coincident: then the tissue swells and bursts; the culm or stalk opens outwardly; and a line of discoloration indicates the hitherto insidious and invisible, but subtle foe.

A discovery in one thing, points out a fact, or else leads to a discovery, in another. Stalks of infested grain are unfit for any thing but to burn; nothing except fire can destroy the vitality of these spores, and even of the seeds of some higher plants. Fermentation in the compost-heap will not answer, and doubtless much of the succession of failure in crops from diseases of the tissue, can be directly traced to the return of the disease to the soil, in the form of manure, or by allowing the destroyed stems to decay on the ground.

And Nature teaches great lessons in other and more serious ways. The total failure of crops induces famine and human misery. The organic tissue of plants is as liable to disorder, as is that of the animal kingdom. The valuable and almost indispensable potato seems marked for more or less extensive ruin, in the potato rot. This scourge is now pretty satisfactorily proved to be a distinct and specific disease, having nothing to do with the infesting of insects or of fungi. It belongs to the kind of malady which attacks the sweet and delicious pear, and turns it to gall and bitterness; or which cankers the apple, and converts it into insipidity, or something worse. It is a dry gangrene, a conversion of the parts of the tissue into a peculiar substance and consistence, not destroying the starch globules, nor depriving the root of all its nutrition. Any remedy to be sought in cultivation from renewed seed, or from new raising from the balls or seed-vessels, will prove futile; and probably a hope of its cure will be found desperate. As an article of food, some intelligent persons have long doubted its great or paramount

value, and think that if less were raised for that purpose, there would be no real loss, and perhaps some decided gain.

The deficiency of Scientific Information in the Agricultural Community, and the need of its being supplied.

[*An address, delivered before the Agricultural Societies of Hampshire, Franklin and Hampden Counties, at their Anniversary Fairs, in Springfield and in Northampton, in October*, 1847, *by* Charles Upham Shephard, *Massachusetts Prof. of Chemistry and Nat. History in Amherst College, and Prof. of Chemistry in the Medical College of South Carolina.*]

It would be difficult, perhaps, to single out any association connected with the business of life, that has surpassed the Agricultural Society in usefulness to mankind. Its origin and office are easily understood. It is a natural growth from that friendly intercourse existing between persons engaged in this noblest of all arts. In place of the "no admittance," so commonly placarded over the doors of workshops and mills, it has happily ever been the interest and the custom of the farmer, to invite his neighbor, and the stranger even, to a free survey of his acres. His would seem to be a pursuit too ennobled of heaven to give countenance to secrets and patents. He rears no barriers to conceal his crops; he employs no private nostrums for enriching his soil. All is open and above-board, like the clear canopy of day, beneath which his labors are conducted. Instead of hindering any man, whose object is information, from crossing his fields, he is ever ready to become his conductor, and to explain to him the details of his success: nor does he covet a prouder reward, than to find his example, in some particular, deemed worthy of imitation.

The Agricultural Society is merely an expansion of this unselfish intercourse among farmers, in which the men of remoter neighborhoods seek to become acquainted with one another, to compare ideas on a wider range of topics, and in which they carry the generous emulation excited, to its highest pitch, by yearly exhibitions of their products and skill. The compara-

tively unimportant appendage of the annual address, would scarcely be worthy of mention, save for the purpose of explaining the reason of our present meeting. It seems to have grown, in part at least, out of a desire of persons of other pursuits to meet the farmers and their happy families, face to face, in some formal manner, and to assure them of their deep sympathy in the march of improvement. The speaker, so far as I understand it, is generally selected from one of the side pursuits of society, and, being called to address a popular assembly, is not expected to be learnedly didactic, or technically profound. If his subject can be seen to have a bearing upon agriculture; if his aim seems honest and well intended for the public good; and if, moreover, his words are few, he is generally allowed to go unscathed of censure. Deeply sensible of the honor bestowed upon me, in carrying out this last feature of the Agricultural Society, and conscious of scarcely any other qualification for filling so delicate a position, than what may arise out of a passionate admiration of country life, and a high regard for the cultivators of the soil themselves, I shall proceed, according to the best of my ability, to lay before you a few reflections that have suggested themselves as befitting the occasion. They will relate to a supposed deficiency of scientific information in the agricultural community, and the need of its being supplied, as a first condition to a higher success. In treating these topics, I am aware that I shall bring to your notice little more than the echo of a wide-spreading public sentiment, and one in which, I doubt not, this society itself participates: but though little that is new may be presented, an impetus for good may perhaps be hoped for, in the propitious auspices of the occasion.

In attempting to describe the limited prevalence of scientific information among the agricultural population, it must in justice be premised, that the defect is alike shared by the people, generally, of all pursuits and professions. The farmer is by no means singular in his unacquaintance with chemistry, natural history and physiology, though, from the nature of his occupation, he suffers more than others by such ignorance. Nor are sufficient reasons wanting in explanation of the fact assumed. The practical bearings of these studies have but lately been discovered.

Indeed, the most valued results of some of them have only been obtained within a few years; and hitherto, no thorough attempt has been made, to ingraft them upon our system of school education.

Bear with me then, respected friends, while I hold up a few aspects of that want of knowledge, which appears to stand in the way of your realizing many of the improvements at which your organization aims. It would be an easier, and in some respects a more grateful task, to recount the progress that individuals among us are making, and to exult in our present attainments and future prospects; but I think you will agree with me, that it might not bear so hopefully on the future, as the less pleasing duty now proposed.

In the first place, then, the cultivator of the soil is not acquainted with that internal constitution of matter that makes it what it is in itself, or with those forces acting upon it, which make it what it is in the various uses he has occasion to make of it. While he recognizes a few species of matter, such as iron, lead, copper, sulphur, and charcoal, which he cannot help regarding as undecomposable into any thing simpler; the question never occurs, how the case stands in respect to air, water, clay, sand, vegetable mould, woody fibre, starch, sugar, oil, and bone, with the whole crowd of familiar substances by which we are surrounded. Indeed, to persons unacquainted with chemistry, the very idea of an element is a mystery in itself; while, as a matter of course, they can know nothing of their number, or comparative importance in nature; and still less, of the reasons for believing that they remain to this day, in the number and shape of their final atoms, the same as in their first creation. Out of the thirty or forty of these elements, necessary to be known, in order to comprehend the constitution of ordinary matter, how small a number has the farmer been permitted to see in an insulated shape, and in those he has accidentally seen, how rarely has he recognized this elementary character! Equally unconscious is he of the fact, that these elements, if brought into contact with each other, possess, in various but perfectly determinate degrees, the power of interunion; so that two or three different elements rush into an intimate combination, with

a force far less under our power to control, than may be required to suspend a body from falling to the earth; that the new bodies, again, possess a similar power, among themselves, of uniting to produce a higher order of compounds; that in all these, the elements are present in proportions never varying by the minutest fraction; and finally, that all compounds, whether natural or artificial, whether the products of the mineral kingdom or built up under the influence of vitality, are liable to be subverted in their composition, and to have their elements collocated anew, simply by the presence of other forms of matter, or the influence of heat, light, electricity, or the living principle itself.

Without these ideas, fundamental as they are to an intelligence of the source and origin of soils, and the separate agencies of earth, air, and water, in vegetable growth, the whole art of the husbandman is one of the blindest enigmas ever presented to the human mind; and no wonder is it, in such a case, that the bulk of mankind regard the disguised forms in which the elements present themselves, in ordinary vegetable growths, as independent, original shapes, created by the vital principle outright; for what other more rational view is there left to the man, who plants a kernel of corn, and who knows not of the fifteen elements of matter that are requisite to the formation of the perfect stalk and full-grown ear—which, and how many, find access by the root, and which by the blade—who discerns neither the routes by which they enter, nor the shapes in which they come. What is more natural than for such a mind to conclude, that the seed planted possesses, in some way, the power, under the favoring stimulus of a rich soil and a genial temperature, of creating anew each increment that is made to its substance? The planter sees nothing enter the tissue; he detects nothing within it that his senses recognize as belonging either to the air above, the earth beneath, or the waters under the earth. Wherefore, then, should he regard vegetable growth other than a new production like that of matter in its first creation? Well may he continue to call his crops *produce*, though, to the view of the chemist, they are as simply manufactures, as the products of the button-factory, the flouring-mill, or the paper-machine.

The cultivator has, indeed, learned by experience that certain

soils are adapted to particular crops, and has perhaps been told that this depends upon the fact, that some chemical compound is present or absent in such soils. He has heard it assigned as a reason, why the grasses soon tire if kept without change in one soil, that they exhaust the alkaline silicates more rapidly than, in the process of decomposition or of manuring, they are afforded to the soil. Phosphates of lime and magnesia, and nitrogenized bodies, are mentioned as indispensable to the grain crops. But what are silicates, and phosphates, and nitrogen compounds, but terms of ignorance, to the uninitiated? Neither their composition nor properties can be understood, without the fundamental information of which we are speaking. What the practical man wants, is to be carried clear back of words to things,—behind compounds, to elements. These, for once in his life, at least, he should be permitted to see face to face. He ought to know whether they are solid, liquid, or æriform; what is their color, density, and other sensible properties: and more especially, what friendships they have for one another; by what laws they build themselves up into compounds; and by what rules these, again, transform themselves into still other combinations, or split into their primitive elements.

But, leaving the composition of the solid earth, and the living beings it supports, what, let us inquire, is known concerning the air, that transparent medium in which we live, and move, and have our being? How far is its actual weight appreciated, what is known of its power of commingling with other gases, of dissolving liquids and even solids themselves? Who realizes that the air, in invariable proportions, is made up essentially of two elements, as diverse in nature as charcoal and sulphur? How few are aware, that it is ever suffering important changes from the burning of combustibles and the breathing of animals; and that these changes would be fatal to ourselves, unless corrected by the respiration of plants! Notwithstanding much is said about the atmosphere, about good and bad air, and airs dry and wet, hot and cold, very few are the persons who are rationally convinced of the nature of that deterioration which takes place in an atmosphere that has sustained the combustion of ordinary fuel or lights. Few, very few, are the persons who practically

believe, that the burning of coals and candles generates a poisonous gas, which, when it rises to the proportion of three parts in the hundred of the air, is adequate, in a few hours of time, to produce insensibility and death! That this ignorance is not imaginary, we have the most unhappy proofs occurring almost weekly, throughout the cold season of the year, in the production of alarming symptoms, and, not unfrequently, of melancholy deaths. This is a case, where it would seem that nothing short of science can impart the necessary faith. What can appear more harmless, than to breathe the air of a room where the burning fuel yields neither odor nor smoke! "Why suffer one's self," says the shivering lodger in some contracted apartment without a fire-place, "to be alarmed where no danger is apparent? What if it has been said that charcoal vapors are dangerous; there do not seem to be any of them here: besides, it is difficult to see the reasons of such a prejudice." Meanwhile, the warmth is genial; and the unsuspecting victim quickly composes himself to a slumber from which he is never again to awake! The jury of inquest, summoned on the following day, give it as "death from charcoal vapors;" but the chemist, who reads the verdict in some newspaper, translates it to "death from ignorance of chemistry;" for, had the victim, when at the district school in youth, been blessed with the sight of a few experimental illustrations in science, he would as soon have leaped into a well, as have retired to sleep in a close apartment, warmed by an open furnace of charcoal!

But a more universal proof of practical disbelief in the properties of the air, and its vitiation by being breathed, is afforded by the general neglect of ventilation in country houses. The architects of our cities and larger towns do indeed appreciate, to a good degree, the phenomena that transpire in the breathing of atmospheric air. They act upon the well-established facts, that every individual, according to his age and size, requires a certain number of cubic feet of pure air, for his daily consumption in the lungs, just as absolutely as he does a certain number of ounces of food, for nourishment in the stomach; and that the air thus breathed has its life-sustaining element first absorbed, and then returned to the air in the condition of the same narcot-

ic poison as that which is given off by burning fuel; and which, when it has risen into the air of an apartment in a certain proportion, begins to act as an oppressive soporific, and may in particular cases, from want of free ventilation, accumulate to such an extent, as to occasion lasting, and even dangerous indisposition. Such architects, accordingly, construct apartments of the proper height and shape, and with apertures in the sides and top, to facilitate a communication with the external atmosphere. But how is it in the country? Let the small dormitories of most country inns, the cage-like dimensions of school-houses, the low, flat ceilings of townhalls, and even churches, give the reply; to say nothing of the contracted apartments of the farmer's own dwelling, for which no apology can be found in the costliness of a ground-plot, or the scarcity of building materials. Many are the laborers in the field, it is to be feared, whose sleep is shorn of more than half its refreshment, from a disregard to the fixed relations they sustain to the atmosphere. Many have been the speakers who fondly hoped to move their fellow-men by the force of their arguments, or to delight them with the playfulness of their wit, who have found, when they rose to the task in some flat-roofed, closely shut hall, that an unexpected extinguisher to their intellects was on both themselves and their auditors. Many a highly talented teacher of sacred things, whose people, in spite of his and their best endeavors, have sunk into torpor and listlessness, would do better to change some of his meetings into a plain illustration of those laws of nature, and of our physical constitution, which would enable us to enjoy without self-injury the commonest blessings of Providence, at the same time that they place us in a better position for appreciating the higher truths that affect our moral destiny. For this reason, I confess that I have been disposed to look with more favor, than many appear to do, upon those religious meetings which are occasionally held in the open air, in the streets of London and Edinburgh, and in the fields and forests of our own land. They are certainly favorable to the highest and clearest efforts of speakers, no less than to the deepest and most lasting impressions of hearers; and such performances can hardly be brought into comparison with those confused and fugitive

thoughts, poured forth, from half-comatose brains, upon audiences panting quite as much for wholesome air as for a holier life.

Few persons are conscious of the extent to which philosophical principles are involved in the sphere of the farmer's labors, or of the importance of their being understood, to the minutest detail. The stable-yard enclosure is, properly speaking, the farmer's bank. Now is he, think you, a good money-banker, who never troubles himself about the fluctuations of trade, or the theory of discounts and exchanges; who knows not the value of different currencies; who takes without discrimination whatever is offered, and pays out whatever is called for; and, above all, who never locks his doors or his money-chest? Just so injudicious is the farmer who comprehends not the theory of organic fermentation, and who is ignorant of the composition and value of the nameless matters that accumulate in the stable-yard, and who leaves all exposed to the winds, the rains, and the sunshine, of heaven.

One of the simplest, but yet one of the most universal of all the properties of matter, is its regular expansion for every addition of heat; so that the scientifically trained person never looks to see matter around him preserving uniform dimensions, any more than to see the mercury in the thermometer stationary. All bodies are perpetually enlarging and contracting, as they acquire or lose even the slightest degrees of warmth. Were but this very common principle better apprehended, many are the structures of masonry that would now be standing all the stronger, without the rods of iron with which their builders vainly attempted to strengthen them. And many a valuable horse would go free of pain and the fault of lameness from having had a shoe nailed to his foot before it had cooled down to the temperature of the hoof. A gentleman of my acquaintance was lately placed in a most awkward dilemma, from the ignorance of the blacksmith, who set up a piece of iron paling in front of his house, without making any allowance for the expansion and contraction of the material under ordinary changes of temperature. The consequence was, that while the central gate, in front of his door, would open and close with facility in cool weather, it was as immovable, in hot, as the fence to which it

pertained. And thus, the surprise of the proprietor's visitors and friends may easily be conjectured, when they found that, the warmer the day, the colder was their reception!

But is there no need of chemistry within the farmer's house? A little instruction in the doctrine of chimney-draughts, and in the laws which regulate the radiation of heat, would not only be a specific for many a smoky apartment, but would very nearly overturn the present economy of open fire-places and ovens. And suffer me to ask, if we do not still hear of the caprices of soap-making, and failures in the making of palatable bread. We would not be thought mealy-mouthed; but are there no exceptions to mealy potatoes on the family table? Does the housekeeper, who essays the making of sweetmeats, and who has scrupulously observed the proportions of fruit and sugar, not sometimes find, to her surprise, that no jelly crowns the experiment? But the greatest case of defective knowledge in domestic life, undoubtedly relates to the use of bolted flour, instead of the whole ground or unsifted meal; since the latter surpasses the former, by one half, in all the purposes of nutriment, and fully equals it in agreeableness of flavor.* If the fastidious inhabitants of the city will still adhere to that preparation of the cereals, which consists of little else than pure starch, to the rejection of those more precious constituents which every chemist knows to be indispensable for imparting firmness to the muscle, fullness to the outline, and strength to the bone, why, of course, there is no help for this folly; unless perhaps it be for them to take still another portion of starch, in the form of buckram, and, as a substitute for live bones, to go on borrowing from the whale, in order to prop themselves into shape; but let us never be told of farmers, who are willing to do such violence to home-spun common sense, as to banish the good old-fashioned brown loaf, together with unbolted meal cakes and puddings in all their simple and delicious forms.

Did the time allow, we might go on to particularize other departments of science, at present but little appreciated by the farmer; such, for instance, as those connected with meteorology,

*See Prof. Johnston's paper on the chemical composition of unbolted, or whole-ground meal, in a late number of the London Chemist.

the sources of springs, the origin of soils, the laws of electricity, together with vegetable and animal physiology. It is not denied, that much is understood on all these subjects, as well as upon those which have been noticed more at large; what is complained of is this, that the current facts are not systematically acquired, or arranged in the mind under their appropriate principles. The consequence is, that a majority of them are inoperative. They are rarely at command when they might prove of service, and are even incompetent to suggest any thing in advance of themselves. Unarranged facts, by the side of general principles, are like mob-force when compared with that of disciplined troops. What we so much want is, an intelligent comprehension of a few governing principles. About these, all related facts will cluster spontaneously, as iron-filings gather round the poles of a magnet; and the principles, like the magnetic needle, will be sure to point the right way.

I am aware that there are some, who will have it that the cultivator has no business with scientific knowledge, and who maintain that dry rules are enough to meet his wants. Passing by the moral disrespect implied in such an opinion, it will be enough to say, that the farmer is required for the most part to supply his own rules of thrift. There is no great fountain of wisdom and beneficence in the learned professions, in the other arts, or in the state, from whence the needed information may flow forth. On the contrary, the improvement must be made by those who want it,—by those who are to experience its greatest benefit. And when it is made, it will often be found, not to consist in a few summary processes, so plain and easy as to secure immediate and universal success, but rather in a scrupulous attention to petty details, before overlooked, but which, in the light of science, are perceived to be of prime importance to the grand result. The common farmer, without such light, will of course keep on in the old routine. As he lacks the faith in natural laws, he cannot be expected to manifest that constant vigilance and enduring patience, on which alone the improved success attends. No: nothing can be more certain than the fact, that, if the farmer is to reach a higher grade of independence, it can only be the result of an education, in some

sense, corresponding to such a destiny. If it is attempted to bring about the result by a better education in matters of history, general literature, political economy, and even religion, to the neglect of the scientific principles concerned in his art, it will be found, that no progress will ensue; for the farmer, before every other, is the "man," of whom it is the truest, as Humboldt has said, that he "can make no use of nature, can appropriate none of her powers, if he be not conversant with her laws, and the relations of number and measure existing amid her processes."

But it is time to recur to the voice of experience, in relation to the benefits of scientific knowledge in agriculture. The modern history of British husbandry furnishes all the testimony we require on this point. In adducing the results on which I rely, your attention will also be directed to some of those principles, on which the experiments were based; and, in view of which, the great changes in their system of culture have been effected.

We shall first notice what has followed, from the system of thorough draining. In taking off the superfluous water by underground drains at a depth of $2\frac{1}{2}$ feet, and placed 8 or 10 yards asunder, they aimed at the following advantages:—1st. To impart to the soil a comparatively dry and porous state, whereby it would be freely percolated by the warmer water falling in showers; and which brings down, from the atmosphere, carbonic acid, nitric acid, and ammonia,—those essential elements of vegetable growth: 2d. To increase the temperature of the soil still further, by freeing it from that constant presence of water, which chills whatever is in contact with it from evaporation; and, at the same time, to allow of the penetration of atmospheric air among the pores of the soil, where it may minister to those chemical changes indispensable to the nutrition of plants: and 3dly, To lighten the labor of tillage, and to improve the healthfulness of regions where fever and ague miasms before abounded. All these advantages were quickly realized; and lands which had afforded only a pasture of the coarsest kind, that yielded little beside the harsh sedges and the most worthless aquatics, have repaid in the first crop the heavy cost of draining, and given back more than the original value of the

soil. The Duke of Rutland has thus redeemed 5,500 acres of land; and, in doing so, has employed 11,000,000 tiles. Hundreds of thousands of acres of marshes and fens, once covered with peat and stagnant water, are now intersected by canals; and, in many instances, the water is lifted out by powerful steam-engines, leaving fields that now yearly wave with golden crops of grain. In the neighborhood of Ely, is a tract of 800 acres of wet land, that sold for as many shillings, which now rents for nearly ten dollars the acre.

But science has not only suggested, to the cultivator, the importance of removing, by subterranean drains, superfluous water from some of his lands, she has taught him the value of the converse process of introducing it upon other tracts, by means of channels above ground. Reference is not here had to that species of irrigation which has been practised from the oldest times upon the parched lands of Asia and Southern Europe; but to the system of winter and spring flowing of grass lands, instituted chiefly for the purpose of supplying alkaline silicates, earthy carbonates, and other well-known ingredients of the grasses. These are brought down in the water draining from higher regions, and which is delivered by means of shallow gutters, carried around the descending slopes, tier below tier, in such a manner as to be distributed over the intervening valleys and flats. By this method, wide districts have actually increased, in the enormous ratio of 800 per cent. upon the income they formerly afforded.

But the successes obtained in the counties of Norfolk and Lincolnshire, in consequence of the study bestowed upon the composition of soils and fertilizers, are, on the whole, among the most striking we are able to bring forward, and serve of themselves to place scientific farming on the highest possible ground, as contrasted with the old system of routine. We are informed, that the late Lord Leicester found, at the close of the last century, that, under the old modes of culture, his naturally barren, sandy soils, which had been producing only poor crops of rye, finally ran down, so as to command a rent of only one dollar and a quarter per acre. As a last resort, it was turned over to the improvements of science. Well-contrived experiments were set

on foot in every possible direction. The cake, or cheese, remaining after fixed oils are expressed from oleaginous seeds—a substance rich in phosphates—produced wonders in fitting those lands for the production of wheat. Marls were turned up, and freely applied to the surface. A new breed of sheep was introduced, in place of one less profitable,—among other good results of which, was the stamping together of the soil, and rendering it more tenacious of moisture. Oxen and pigs were fattened in great numbers, for the purpose of enriching the fields. Bone-earth was applied in large quantities, as a manure for the turnip-crop. The result has been, that it has become one of the finest wheat regions in Britain.

Still another proof of what science can achieve in agriculture, is afforded in the contiguous county of Lincolnshire, which, little more than fifty years ago, was, to the extent of one quarter of its area, little better than a perfect waste. It contained one barren range of hills, near forty miles in extent, known under the name of Lincoln Heath; where, in old times, a lighthouse was erected, to prevent travellers from being lost in crossing its surface. It now presents the marvellous contrast, of the most perfect field-agriculture in the whole country; and is little else than a succession of well-constructed houses, barns and offices, surrounded with crowded grain-stacks, on farms varying from 500 to 1000 acres. It is now an abundant grain country, yielding also vast crops of turnips, and sustaining immense flocks of sheep. One farmer, in 1823, took 700 acres of this once inhospitable and dreary region, then not worth the yearly rent of a pair of rabbits to the acre. By a system of four-course rotation of turnips, barley, clover, and wheat, the first of the course being sown with 16 bushels of bones per acre, and the turnips consumed on the land by sheep, together with the feeding of hay and straw along with oil-cake to horned cattle, he has raised the entire tract to the fertility of a garden, and himself to independence. The wolds of Yorkshire, to the north of Lincoln, have undergone a similar renovation.

At the extreme northern end of Scotland, in latitude 58 1-2 degrees, where, less than 50 years ago, a few small farmers lived, in rude cabins, and under the shelter of side-hills, whose only

stock consisted of a few half-starved cattle, that wandered over fenceless commons, one of which contained 60,000 acres, the whole is now under cultivation. Where wheat and oats were once unknown as crops, 50 bushels of the former, and 56 of the latter, are now often quoted; and where as prolific a yield of turnips and potatoes is afforded, as in any other county of Scotland.

To conclude this citation of facts, I adduce the case of Mr. John Morton, a celebrated writer on soils, and one of the most truly scientific cultivators in England. He rents the farm called Whitfield, situated about 13 miles from Bristol, on the road to Gloucester. It consists of 232 acres. Prior to 1839, it rented for $1000 a year. It then had 68 acres arable, and 164 in pasture. The produce barely enabled the tenant to live in a poor way, and to lay up about $140, annually. Under Mr. Morton's system, the profit, over the old management, has been fourfold; and he gives employment to more than three times the number of hands, in performing the work of the farm. He raises 26 tons of turnips to the acre, and 45 bushels of wheat.

Notwithstanding these facts concerning the increased produce and rents in Great Britain, doubts may still exist whether, after all, they grow so directly out of the possession of scientific knowledge on the part of the cultivator: since it is universally admitted, that the farming population of that country is greatly behind that of our own, in general intelligence. Now it is freely admitted, that this is true of the mere laborers on English estates; but it must be borne in mind, that these persons have just as much to do with the planning of crops and the stocking of farms, as the day-laborers on our railroads and canals, have with the department of engineering, on these great works. Nine tenths of the men who perform the agricultural labor in that country, never own, nor rent, a rood of ground. Of late years, a few landlords have, under what is called the allotment system, granted to their most industrious operatives, who, for good conduct, are also able to procure the recommendation of the clergyman and two other citizens of the village, the enormous boon of the rent of $\frac{1}{6}$th of an English acre of ground, at ten dollars per annum. From this, it will easily be seen, how far the general

intelligence of the farming population in Great Britain is concerned with its system of husbandry. No; this depends, comparatively speaking, upon the character of a few individuals,—upon the landlords, and the principal land-agents. And in relation to these, nothing is more freely conceded in that country, than that the improvements have been confined to such, among them, as have appreciated science, and worked in conformity with its fundamental principles.

Still, all may not be convinced that we, of New England, need any considerable modification in our agriculture. "What," say they, "are we not making, on the whole, very satisfactory crops? Are we not prospering beyond any other people on the face of the globe? Then let us adhere to the prudent maxim, of letting well-enough alone." Yes; this might do, if the well-enough of others would only let us alone. If these contented persons could stop the advancing ideas of their children, in respect to a higher enjoyment of the comforts of life and a more expensive education,—if they could keep taxes down and the produce of western lands out,—they might get along, for half a century longer, with the present average crops of 25 bushels Indian corn to the acre, of 12 of rye, 15 of oats, a couple of cart-loads of potatoes, a ton of English hay, with the customary live stock, the old orchard, and the meagre garden-patch. This fashion of cultivation might answer, I say, if the world of enterprise elsewhere would wait upon them, or, still better, if it would have the goodness to retrograde. But since it consents to do neither, but, on the contrary, is steadily advancing, there remains no alternative for such persons, but either to participate in the movement, or else to see their sons quitting their homes for the West, or the ocean, their daughters entering the cotton-mills, and their farms sliding from under them into more enterprising hands.

But, happily, the speedy remedy to any threatened stagnation or decline in New England farming, is in the hands of her people. The example of individuals among us, who are already beginning to reap a rich reward for the increased assiduity with which they are applying themselves to the improvements of the day, is fraught with the highest encouragement. Let land-own-

ers here, as in Great Britain, study with diligence the principles of their art. And, particularly, let them lay a broad basis for the scientific training of the rising generation. Nothing short of a thorough incorporation of the elements of the physical sciences with our system of common schools, will, in the long run, answer the emergency. And for accomplishing this, there must also be established, a class of higher institutions for the preparation of teachers, as well as for the thorough education, in practical farming, of individuals who have before them the prospect of managing large estates.

It would be of great advantage, for instance, if the country school could have the opportunity, during two half-days of each week, of seeing experiments in mechanical and chemical science, of being drilled with examinations, and of being stimulated by suitable prizes to proficiency in these branches of knowledge, under the direction of a fully qualified teacher, who might perform this service for four or five schools at the same time. The young would thereby become convinced of the importance of such studies; and would early acquire habits of investigation, that would both stimulate and assist, in the subsequent work of self-education.

But, leaving the more elementary schools, I proceed to speak with more detail of the agricultural school, a topic which is beginning to take a deep hold of the public mind.

Many persons appear to think, that our college course can be so modified, as to fulfil, at the same time, the literary and the agricultural requisition. It does not appear to me, that such a plan is likely to succeed. Heretofore, most certainly, whatever else the college has afforded, it has turned out few practical farmers. Even those, who enter as well drilled and expert in farming operations, by the time they reach the terminus of their course, if they do justice to the college studies and become thoroughly imbued with the spirit of the place, become rather awkward on the farm; and it very soon begins to appear, that to be college-learnt, is to be farm-unlearnt. And I hardly know of men more to be pitied, than those who, from feeble health or any other cause, have failed in a professional or literary career (to prepare for which, the college course is chiefly in-

tended,) and who are obliged to fall back upon the farm for a livelihood. In all the practical labors of husbandry, they seem to have lost the art of taking hold of things by the smooth handle; and their blunders in live-stock, are almost sure to make them the laughing-stock of their neighbors. Now there is nothing surprising in this, if we consider the object of college education. The college is not intended for persons who are to occupy themselves much with physical matters. Even the boys understand this perfectly well; and it is to be feared, that not a few importune their parents to gain admission there, from no higher motive than to get clear of muscular effort; though it is generally observed, that such are equally shy of intellectual exertion. No: the college is a place for the training of persons, who, if they are ever to work at all, must do so through the medium of mind, as scholars, as statesmen, as clergymen, or in the medical or legal profession. Nothing can be more unreasonable than to suppose, that we see the practical use of the sciences to mankind, in the lives of our college graduates. Why, the college course is chiefly made up of a study of the literature and philosophy of the ancients, to whom our sciences were a dead letter, and of the elements of mathematics and geometry, to which is added a sprinkling of metaphysics and logic, and considerable drilling in English composition and elocution. On these studies, and good morals, the discipline and the honors of the college turn. Lectures are given, indeed, on some of the modern sciences, but less with a view to their bearing on the arts of life, than to the purpose of intellectual discipline and general accomplishment. No teacher will be tolerated, who should more than incidentally allude to any common use, like that of economical profit, that could be made of them. The college is not the place for learning rules of thrift. It presupposes a degree of independence; and in cases where this is not enjoyed, it takes it for granted, that money-making is to be held as a secondary consideration with all who partake of its benefits. The college graduate is never to seek glory in wealth, but in knowledge, and in usefulness of a lofty kind to his fellowmen. This I take to be the true theory of the college and of literary life in general. Both hold themselves at the most re-

pectful remove possible, from all contact with matter, and the every-day labors of men engaged in the arts. I might perhaps afford you an illustration of the truth of this representation. A president of one of these institutions, on being shown through the physical department of another, the best-endowed in natural sciences of any in the country, on taking leave of the distinguished professor who had been his conductor, begged to know of what conceivable use to mankind were all such provisions! Here was a distinguished scholar, at the head of an American college, who had got so completely away from matter, as not to be conscious that a knowledge of its properties was of the least utility to mankind!

Take one other exemplification of the difficulty which the mere literary man experiences, in estimating aright the practical business of life. One of the most eminent of American scholars, and at the same time a distinguished statesman, argued a short time ago in Congress against the employment of the Smithsonian fund, for purposes of practical advantage;—using the word "practical" in its common acceptation, and, of course, in opposition to its college and literary use. He entertained the House of Representatives with a strain of fine thoughts, expressed in lofty diction, in favor of appropriating the money to the purchase of a library. In the course of his remarks, he insisted, that "a laboratory was a mere charnel-house, and that experiments are but the dry bones of science." He would direct the attention of mankind away from matter, "to those great subjects," as he was pleased to style them, "which are not bounded by the three dimensions, which are not ponderable, not cognizable by any of the senses." In the halls of the American Congress, in the year of our Lord eighteen hundred and forty-six, asked this polished orator, in dead earnest, "What have our boasted researches taught us to accomplish, in the industrial arts, that the cunning workmen of Egypt and Tyre and Greece could not do, three thousand years ago?" And, to crown the climax, he claimed, that our independence was declared and maintained by scholars! Listen to the declaration, ye shades of Washington, the farmer and civil engineer—of Franklin, the printer and electrician—and of Jefferson, the

man who has left this testimony of scholastic pursuits: "the business of life," says he, "is with matter, that gives tangible results; handling that, we come at the knowledge of the axe, the plough, the steamboat, and every thing useful in life; but from metaphysical speculations, I have never seen one useful result." Fortunately, the argument of the scholar, on that occasion, fell into something very like the laboratory he so much abhorred, where it was first analysed, and then weighed in the balance of common sense; and the result of the whole was, that, in spite of it, that noblest bequest of a practical chemist, to a practical people, was saved from what would have been little better than a sequestration.

The time has fairly arrived, when society should understand what it has a right to expect from the college; when it should know this at least, that it is not the most likely place to look for melioration in the practical arts, especially in that of agriculture. The college has enough to do, to qualify for head-work. There must be some other institution, in which young men can be taught to work on matter, as well as upon mind. To send a lad to college, whom you intend to make a farmer, is putting him on the wrong track. The four years spent there, would be an episode, a parenthesis, in the preparation for active life on a farm. I say not that it would disqualify him from leading the life of a gentleman, provided his means were sufficiently ample; but it would assuredly be a bad thing for him, ever to take off his gloves on a farm, after he had touched his diploma.*

I should shrink from the attempt, even to draw out the plan of such an institution as is required to meet the wants of this greatest of all the branches of practical industry. To frame

* In these remarks upon the inadequacy of the college proper, for preparing persons for the practice of the arts, I trust that I shall not be thought wanting in a proper regard for these institutions. Having, either as pupil or teacher, passed the greatest part of my life in connection with the college, I can but accord to it the highest respect and even filial affection: but this veneration is solely on account of the important and truly noble end it accomplishes, in laying the foundation of professional or literary eminence; and not on account of its direct service to the manual arts. These it never has embraced within its plan; nor is it easy to see how any change can ever be made in this respect, which shall fully answer the wants of practical men; although there is nothing to prevent the existence of an agricultural school in immediate connection with a college, whose scientific faculty might even assist in a school of arts, and, in this way, materially abridge the expensiveness of such an institution.

such a scheme, will demand no small share of deliberation and forecast. No institutions are now in existence, upon which they can be directly modeled. In this state of the case, it may not perhaps be deemed impertinent for me to direct the attention of this audience to what has been done in Europe, in behalf of an allied art or profession, which sustains a very close relation to agriculture. I allude to that of mining. Like agriculture, it requires the use of numerous sciences. As the farmer must know his crops, together with many other plants which are either useless or noxious, so the miner must be able to recognize his ores, and those associated mineral substances, which are either worthless or injurious. As the farmer must understand his soils and sub-soils, and the connection of both with the rock formations in which they originated, so the miner must comprehend the various strata, which include his veins and beds of ore. The different processes employed in harvesting and preparing crops for the markets, are, in some sense, analogous to the raising and dressing of ores; while draining, surveying, and architecture, are required in both. Farming and mining both make a constant and similar use of chemistry, in the work of analysis. There is indeed this difference, that the labors of the miner are attended with much greater risks as to remuneration, and with greatly increased dangers to health and life. But it is reasonable, nevertheless, that institutions expressly contrived for the benefit of the miner, and which have been nearly a century in existence, should throw some light upon those we would invent for the use of the farmer.

The most ancient of these institutions, is that of Freiberg, in Saxony. It was founded in 1765, by Prince Xavier, and early placed under the control of the celebrated mineralogist, Werner. At the present time, it has eleven professors, on the following branches: viz., general chemistry, technical chemistry, analytical chemistry, mineralogy and geology in all their branches, natural philosophy, the pure and the higher mathematics, mathematics applied, mining machinery, general surveying and practical geometry, mining jurisprudence and correspondence, and the art of mining. In addition to the corps of professors, it has a surveyor, a draftsman, an assay-master, and a teacher of

French. Candidates for admission must produce certificates of health, character, and a certain proficiency in the common branches of school education. A limited number are supported by the government. The lectures open in October, and terminate in July, the vacations being devoted to mining excursions. The instruction is communicated by lectures, illustrated by figures on the black-board, by experiments, by specimens, and by models, as the nature of the subjects may require. Mondays are devoted to the inspection of mines in the vicinity,—there being, within a circuit of three miles, no less than 100; in which are about 200 vertical shafts, and 250,000 fathoms of adit, wherein may be viewed every species of timbering and masonry. The pupils are required to keep a fair copy of their notes, and of all their lectures. At the end of each month, they undergo a rigid examination upon all their studies; and, at the close of each year, are rewarded according to the result. The course extends through a period of four years; and is admirably contrived for insuring correct practice in every detail of the art, and, at the same time, a thorough comprehension of the principles on which that practice depends.

Another of these institutions, most worthy, perhaps, of being described, was founded in 1770, at Schemnetz, in Hungary, by the Empress Maria Theresa, by whom it was also endowed with great liberality. During the third year of the course at Schemnetz, the pupils are required, on one day of each week, to go through a portion of some mine, and to make out a written report of every thing that concerns its condition. Some of the poorer young men even take jobs in the mine, which serve, in part, to defray their expenses. The semi-annual examinations are held, not for the vain purpose of showing off, but for determining, in the strictest manner, what each pupil has learned. The questions are written on small slips of paper, and are drawn out by lot, by the students, who give the answers on the spot. The most successful are rewarded by having the charge of their education almost wholly remitted; while those who fall below a certain standard are forced to relinquish all hope of ever obtaining government employ. The number of pupils in this institution is, at present, between three and four hundred.

Before dismissing these admirable institutions, here brought forward for illustrating what we need in this country, in order to place agriculture on the highest ground of success, I cannot help observing, that the time has also arrived for establishing a mining school itself. Who that beholds the extravagant zeal of our citizens for mining in the north-west, where hundreds of thousands of dollars have, within a short period, been expended, and where it is reported that 15,000,000 of dollars have been hypothecated in copper adventures, can, for a moment, doubt, that our progress is too rapid, if not in the wrong direction. I shall yield to no man in a high estimate of what American enterprise can achieve, where the field is a legitimate one, and the means employed in accordance with sober experience, enlightened by science; but it certainly requires no prophet's ken to foresee, that an overwhelming majority of the undertakings referred to must end in nothing but rebuff and disaster. This government possesses, in its wide public domain, the strongest possible interest to copy, even at this late day, the intelligence of Germany, in establishing an institution for promoting the knowledge of mining. But, advantageous as it would undoubtedly prove to the public interest, and beneficent as it could not fail of being to those directly engaged in underground labors, it is too much to hope that it will receive any efficient patronage from a people not yet sufficiently weaned from the practice of war. Millions can yet be had, for multiplying the engines of destruction, but little for promoting the arts of peace. Whatever else we may expect, government institutions for mining and agriculture need not be looked for in this country, so long as the star of military glory is in the ascendant. From those states, in which civilization and refinement have rendered war measurably repugnant to the popular feeling, we may hope for a liberal bounty in favor of such undertakings, but from the still barbaric genius of the nation, nothing.

But I return to the agricultural school, upon whose office I have endeavored to throw some light, by describing what has been done by foreign institutions, in behalf of the sister art of mining. Its general province and scope must, after what has been said, suggest themselves to my hearers. Without attempt-

ing to enumerate the branches it should teach, or the number of instructors it should have, I will only venture to state my hearty concurrence in the suggestion, which some of the leading papers in this state have made, that it be located near the region of the Connecticut valley; and that there be connected with it a tract of land sufficiently ample for cultivating every variety of crop, and for rearing every species of stock, suited to our climate; and still further, to add, that it should have cabinets rich in the necessary apparatus, a botanic garden representing all the great families of plants, a laboratory in which the work of analysis should never stop, and a severity of discipline equal to that of West Point.

It would be an easy task to go on pointing out other advantages of such an institution, but I dare not presume further upon your patience, than to allude to one or two, in addition to those already hinted at in the progress of this discourse. It would enable many a lad, not born on the farm, the sons of men in professional life, or of merchants and artisans, to prepare themselves for agricultural pursuits. It would be a safety-valve to the college, now disproportionately thronged, and would sometimes free it of a youth, whose frolicsome career betrays, that it was not purely intellectual occupation for which nature intended him, but rather, that admirable combination of hand-work with head-work, which the farm so well supplies.

And besides the improved methods of husbandry, which would be likely to grow out of such an institution, may we not reasonably calculate upon its affording important aid in contending with those diseases, to which the most important plants and fruits seem liable, as the result of long, artificial cultivation? Consider, for a moment, the present position of society from the threatened loss of the potato crop. Here is a disease in the tuber of this plant, that, thus far, defies all scrutiny. We have neither found its cause nor its remedy. And yet, as, in a time of pestilence among men, few are so absurd as to look for mitigation or relief, except from the resources of science; so here, the most obtuse are probably convinced that our only hope is in a similar direction. And what a splendid gift would it be, if science shall be able to restore to us the independence we pos-

sessed in this plant, prior to the year 1840! For the potato is a vegetable which the rich man knows not how to forego, and one which places the poor man above want. With a shelter from the weather, and one or two acres of ground to plant with this tuber, man may subsist at almost any distance from the miller, the baker, the butcher, and, I may almost add, the doctor. It suits all tastes, flourishes in nearly all climates, and is eminently nutritious and healthful. Its cultivation demands but little labor, and when the earth has ripened the tubers, they are harvested without trouble, and cooked without expense. A few faggots in summer will boil them, and, in winter, the necessary heat is supplied without expense. There is no waste of time in the processes of milling, sifting, kneading, baking, seasoning, jointing or carving. There is nothing deficient nor superfluous in a well-boiled potato. As soon as it is cooked, it opens by chinks, lets fall its thin pellicle upon the platter, and, with a little salt, butter, or milk, is ready for the unfastidious appetite of the hungry man. Start not back with surprise, at the idea of subsisting upon the potato alone, ye who think it necessary to load your tables with all the dainty viands of the market,—with fish, flesh and fowl, seasoned with oils and spices, and eaten perhaps with wines,—start not back, I say, with feigned disgust, until you are able to display, in your own pampered persons, a firmer muscle, a more beau-ideal outline, and a healthier red, than the potato-fed peasantry of Ireland and Scotland once showed you, as you passed their cabin doors! No; the chemical physiologist will tell you, that the well-ripened potato, when properly cooked, contains every element that man requires for nutrition; and in the best proportions in which they are found in any plant whatever. There is the abounding supply of starch, for enabling him to maintain the process of breathing, and for generating the necessary warmth of body; there is the nitrogen, for contributing to the growth and renovation of organs; the lime and the phosphorus, for the bones, and all the salts which a healthy circulation demands. In fine, the potato may well be called the universal plant; and the disease under which it now labors is, therefore, an universal calamity. If any agricultural institution should ever be so fortunate as to make us

acquainted with the means of controlling it, its name would quickly rank by the side of the proudest universities; and if the great discovery should proceed from a single individual, his name would live, when those of the greatest generals and conquerors have become as uncouth and strange to human utterance, as their deeds were unfriendly and opposed to human happiness.

It is indeed a pleasing task, to anticipate the glories of the new day of improvement and success, which is dawning upon the cultivators of the soil. Already has the era of melioration arrived. The number and the zeal of associations like yours are significant omens. The results before and around us, are most encouraging; and the high standard of improvement, every where visible, is a sure presage of ultimate triumph. A new vigor has been infused into the farmer's life; and though an old and venerable occupation, it has, in some sort, taken on a new youth; and this youth seems inspired with insatiable desires, and the most exulting hope. Be encouraged, then, with the old German proverb, that what we strive after in youth, we shall attain to fulness in old age; and concerning which, Goëthe, the poet and the naturalist, has given this fine commentary, "that our wishes are presentiments of the faculties which lie within us, and harbingers of that which we shall be in a condition to perform." Thus, I easily persuade myself, it will prove in your case, in the distinguished zeal you are exhibiting for the improvement of your profession.

When your example shall be adopted throughout the counties of New England, a new order of thrift and intelligence will be discerned among the rural population. The more certain success, which will then wait upon the husbandman, shall supersede the further necessity for his emigration towards the setting sun; and the higher intelligence and refinement, which shall then prevail, will cease to urge, with such undesirable force, such troops of our most promising country youth to seek their fortunes in city life; where, alas, the temptations to vice, and the rush of competition, so often frustrate all their hopes. Then will it be seen, that the most infertile of our districts will be competent to sustain, in comfort and wealth even, a vastly aug-

mented population. Then will it most clearly appear, that there exists no real incompatibility between the labors of the field and a certain degree of mental culture and simple refinement; but, on the contrary, that the uncontaminated air of heaven which the farmer breathes, the beautiful forms with which nature every where surrounds him in her productions, and the constant witness which he is, in his labors, of the beneficial operation of great natural laws, powerfully conspire to the formation of a pure and noble character; and may well justify the expectation, that the country will continue to accomplish more fully, in time to come, than she has done even in the past, her destiny, of supplying to science and literature her most successful proficients, to the learned professions their most distinguished ornaments, and to our great towns their most valued citizens; while she is still able to retain enough of solid worth and attractions, at home, to enable her to make reprisals on the city, by recovering to her own blissful retirement many a man, who in youth, with sound constitution and upright purpose, entered the great mart of trade, but who, amid all his successes, kept alive enough of nature in his soul, to bring him back again to her peaceful retreats, in the evening of his days.

To the spirit of agricultural improvement, we look also, with hope that it will extinguish all lingering remains of military ambition; and that, under its benign and humanizing sway, we shall become more emulous of re-conquering the wastes within our borders than of adding new wildernesses to our already too extended domain. What room is there for brilliant achievement even in New England, in expelling those unsightly enemies of the husbandman that have been permitted to overrun so large a portion of our fair inheritance. Turn your eyes, ye martial spirits of Massachusetts, to that army of golden rods, waving their yellow plumes upon a thousand hills; see yonder dauntless array of life-everlastings, that crowd the wide champaigns; see our highways, and the contiguous fields, beset by insolent hordes of mullen and thistles; and fair meadows, where once flourished the golden grain, now covered with base daisies and sorrel. What fields of glory await you, at your very doors! To dispossess these daring invaders, shall yield you a hundredfold more

of true glory, than to follow the stripes and stars from Labrador to Cape Horn! In the coming age of improvement, who shall say, that to subdue and eradicate one of these pests to the farmer, will not bring as bright a chaplet of fame, as it now can do, to trample down a human foe? Who shall say, that he who shall prove himself foremost in peaceful labors like these, that exalt human happiness, may not reap the highest gift of a grateful country, as surely as he who holds himself ready to barter his conscience in the shambles of party, or risk his life in the barbarous perils of war?

But to whatever pitch of improvement other portions of our great and highly favored country may attain, none can doubt, that this particular section of it is destined to maintain a proud preëminence. Nature herself doth here stimulate man to put forth his noblest efforts; for she gives him a surface to act upon, where she has lavished her most abundant gifts. She has made the Connecticut valley the glory of the land; and she has cast the outlines of this portion of it, in her most bewitching mould. So fraught with beauty is it even, that the passing traveller chides that noisy power of modern improvement, which sweeps him too quickly along, where he would fain linger, in silent admiration or calm delight.

"Enchanting vale! beyond whate'er the muse
Has of Achaia or Hesperia sung!
O vale of bliss! O softly swelling hills!
On which the power of cultivation lies,
And joys to see the wonders of his toil.
O what a goodly prospect spreads around,
Of hills and dales and woods and lawns and spires,
And glittering towns and gilded streams, till all
The stretching landscape into smoke decays!"

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