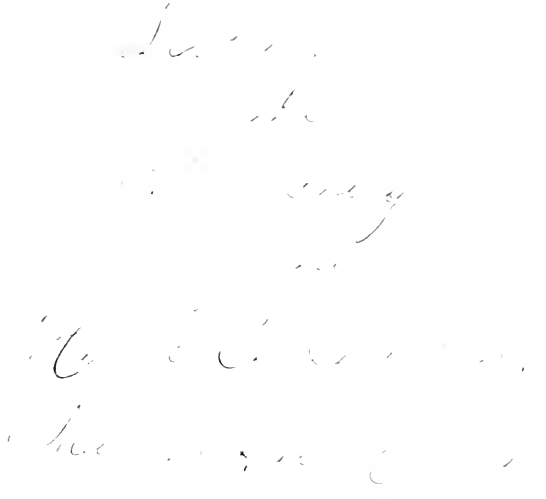


NINTH ANNUAL REPORT

OF THE

SECRETARY

OF THE

Massachusetts Board of Agriculture,

TOGETHER WITH

REPORTS OF COMMITTEES

APPOINTED TO VISIT THE COUNTY SOCIETIES,

WITH AN APPENDIX

CONTAINING AN ABSTRACT OF THE

FINANCES OF THE COUNTY SOCIETIES,

FOR

1861.

BOSTON:
WILLIAM WHITE, PRINTER TO THE STATE.
1862.

STATE BOARD OF AGRICULTURE.

1862.

MEMBERS EX OFFICIIS.

His Excellency JOHN A. ANDREW.
His Honor JOHN NESMITH.
Hon. OLIVER WARNER, *Secretary of the Commonwealth.*

APPOINTED BY THE GOVERNOR AND COUNCIL.

	Term expires.
EPHRAIM W. BULL, *of Concord*,	1863
MARSHALL P. WILDER, *of Dorchester*,	1864
PAOLI LATHROP, *of South Hadley*,	1865

CHOSEN BY THE COUNTY SOCIETIES.

		Term expires.
Massachusetts,	RICHARD S. FAY, of Boston,	1865
Essex,	GEORGE B. LORING, of Salem,	1863
Middlesex,	JOHN B. MOORE, of Concord,	1864
Middlesex, North,	ASA CLEMENT, of Dracut,	1865
Middlesex, South,	HENRY H. PETERS, of Southborough,	1863
Worcester,	JOHN BROOKS, of Princeton,	1863
Worcester, West,	FREEMAN WALKER, of N. Brookfield,	1863
Worcester, North,	JABEZ FISHER, of Fitchburg,	1865
Worcester, South,	SAMUEL HARTWELL, of Southbridge,	1865
Worcester, South-East,	HENRY CHAPIN, of Milford,	1864
Hampshire, Franklin and Hampden,	MOSES STEBBINS, of South Deerfield,	1864
Highland,	MATTHEW SMITH, of Middletield,	1863
Hampshire,	LEVI STOCKBRIDGE, of Hadley,	1865
Hampden,	PHINEAS STEDMAN, of Chicopee,	1864
Hampden, East,	SHERMAN CONVERSE, of Monson,	1864
Franklin,	JAMES S. GRENNELL, of Greenfield,	1865
Berkshire,	HENRY COLT, of Pittsfield,	1864
Housac Valley,	JOSEPH WHITE, of Williamstown,	1864
Housatonic,	SAMUEL H. BUSHNELL, of Sheffield,	1864
Norfolk,	CHARLES C. SEWALL, of Medfield,	1865
Bristol,	NATHAN DURFEE, of Fall River,	1863
Plymouth,	CHARLES G. DAVIS, of Plymouth,	1863
Barnstable,	S. B. PHINNEY, of Barnstable,	1865
Nantucket,	EDWARD W. GARDNER, of Nantucket,	1863
Martha's Vineyard,	DANIEL A. CLEAVELAND, of Tisbury,	1865

CHARLES L. FLINT, *Secretary.*

NINTH ANNUAL REPORT

OF THE

SECRETARY

OF THE

BOARD OF AGRICULTURE.

To the Senate and House of Representatives of the Commonwealth of Massachusetts.

It is gratifying to be able to state that the past year has been one of marked prosperity for the agricultural interests of the Commonwealth. Our crops have been for the most part abundant and profitable, farm labor has been cheaper and more easily obtained than for some years past, and the season was generally favorable, both for the operations of the farm and the growth of vegetation.

The exhibitions of the Agricultural Societies, with one or two exceptions, were more than usually successful in point of completeness and attraction, and the number of interested visitors to those exhibitions was never known to be greater.

The operations of the Board of Agriculture have been continued as heretofore. At the meeting held at the office of the Secretary, on the 19th of February, 1861, various subjects were assigned to special committees for investigation during the year, with the duty of presenting a report upon each at the regular annual meeting.

Accordingly Dr. BARTLETT of the Middlesex North Society, presented the following

REPORT ON THE DISEASES OF VEGETATION.

The power of God, which has so often been put forth to build up and protect our beloved country, has in a special manner interposed itself during the past year to shield our crops from pestilence; and that Providence which "tempers the wind to the shorn lamb," has filled our barns and granaries with a healthy and abundant harvest. We have indeed peculiar cause for thankfulness, that while disease has ravaged the potato fields of Ireland and Canada, and the crops of all Europe have been cut short, we, as a nation, have been blessed with an abundance of food. Yet notwithstanding we have been preserved from the devastating effects of vegetable disease, the opportunities for studying the subject entrusted to us have not been altogether wanting, since the total failure of the fruit crop is only to be regarded as a manifestation of disease, and the disease of the apple tree, which formed the main topic of our report a year ago, has been constantly under our observation.

In previous reports a disease of the bean has been alluded to, which has been steadily increasing and enlarging its area, and will probably soon place us in reference to this legumenous plant, in the same uncertainty which affects us in reference to the potato, making it essential to secure new varieties often, or to find ourselves forced to give up the venerated dishes of our ancestors, baked beans and succotash.

The disease alluded to commences with small brown spots upon the pod, having a nearly uniform direction, commencing near the back of the pod and spreading thence toward its front. The long diameter of these spots being oblique to the two sides just named, apparently affecting the parenchymatous matter deposited between the ribs of the pod, which lie in the same direction.

These spots commence upon the external surface of the pod, and gradually work their way through to its interior, the brown color changing to black as it progresses. If the kernel lies contiguous to such a spot it takes on the same appearance, and becomes dark colored or even black, according to the time which is afforded for its progress by the period which elapses after the disease commences, previous to the ripening of the pod. The superficial area of the spots does not appear to increase after their commencement, and their nature would *seem* to be that

of dry gangrene. In some seasons the fruit is so much affected that the crop could hardly be disposed of in the market, in consequence of the large proportion of discolored beans, and in all seasons if the pea beans offered in the market be carefully examined, more or less of them will indicate the influence of the disease by a black discoloration at the point where it touched the pod.

Most varieties are liable to the attack of this pest, but some are much more susceptible of its influence than others, the Saba, Horticultural, and Case Knife, being most commonly affected among the pole beans, while the bush varieties are equally subjected to its pernicious effects, and neither varieties of soil nor differences of season appear to affect its extent or its progress.

Nothing particularly new upon the disease of the apple tree, described in the report of 1860, has presented itself, but a more careful and extended examination of diseased trees tends to confirm the conclusion that trees trimmed or injured previous to the 1st of May are more liable to take on the disease at the point of injury than those upon which the operation is performed at a later period. One marked case, illustrating this point, it may not be improper to relate. In the month of November, 1856, an old apple tree, the top of which was much decayed, was trimmed for grafting in the ensuing spring. Two large trunks, measuring more than twelve inches in diameter, were sawn off, the stumps being left without protection from the influence of the weather, the chief portion of the old wood being thus removed by the saw. About the middle of the following April the young limbs which grew below the stumps made in the preceding autumn, were grafted with the orange sweeting. At the present time the large stumps sawn off in November, five years ago, are perfectly sound, and although not healed the wood is very hard, almost like iron, and the bark entirely free from blackness, while nearly, if not quite all the stocks grafted in April are more or less diseased. Another fact bearing upon a theory sometimes advanced—that this disease originates in the excoriating character of the sap—deserves notice. It is this: that the disease commences often upon the upper side of the grafted limb, where no sap flowing from it could by any possibility be applied. Instances are not wanting of this disease in other varieties of

trees than the apple. The black oak of our forests is affected in a manner precisely similar, and induced apparently by the operation of the same exciting cause, viz., injury in some form. This subject has not been investigated with sufficient thoroughness to make it at all proper to theorize upon the specific nature of the disease in question, or its predisposing causes; but if future observations should confirm the fact which we have hinted at in regard to the effect of spring trimming, a point will be attained from which we may be able to start in future investigations, with a reasonable expectation of more certain results.

It will not perhaps be thought out of place in this report if we give a small space to the consideration of the remarkable failure of the fruit crop, which has during the past year equally disappointed the hopes of the producers and consumers of what had grown to be considered a necessary of life.

For some years a feeling of uncertainty in regard to the investment of much capital in fruit raising, has been gaining strength in many agricultural districts, based upon partial failures of some specific crop, and as certain theories have been adopted by fruit growers to explain the failures which have given so much cause for complaint, it will be proper to examine the facts in the premises, not so much to establish new theories, or confirm old ones, but that obstacles which now hinder us from arriving at the truth may be at least partially removed.

Our stone fruits, coming into the comparatively high latitude of New England, from the mild and genial climates of Persia, southern China, and Asia, could not fairly be expected to become so completely changed in nature that they should not often fail occasionally to mature crops of delicious fruit; and in regard to the peach and the plum, their early maturity and short term of vigorous life would very much impede, if they did not entirely prevent any great degree of adaptation to their new climate; and perhaps this is all that need be said of those two varieties.

Whether the cherry is about to place itself in the same class with those just named, or whether it is gradually breaking down under the debilitating influence of excessive cultivation, is yet to be determined. It is certain however, that no tree, however vigorous, can for a long period remain capable of fully maturing its buds, while subjected to the attacks of the immense

number of insects which constantly feed upon the foliage of the cherry tree, and thus check the maturing of its new wood. These remarks upon the cherry are not offered so much to explain the peculiar failure of the last season, as because they have a bearing upon the almost universally dying condition of the trees.

The apple crop of New England, being of far more present importance than all our other fruit crops together, we shall devote the remainder of our report to its recent failure, and a statement of some simple facts in relation to it. The orchards in most sections of Massachusetts gave early indications of a fruitful season, so far as a very full bloom could point to such a result; but while the apples were well and abundantly formed, they fell very profusely from the trees, until most of them had no more to cast off. A very commonly received explanation of this fact attributes it to the injury inflicted by the curculio. To test this point one hundred Gravenstien apples were taken from the ground at random, no other selection being made than was sufficient to pick those as nearly uniform in size as possible. Thrown promiscuously into a basket, each apple was examined carefully for the wound indicating the attack of the insect. Of the whole number gathered, only twenty-three were found with the "mark of the beast" upon them. At this time the tree retained only three apples, two of which had the crescent shaped wound. Of these, one had been attacked in eleven distinct points, and yet grew to be the only tolerably perfect apple upon the tree. We think this may be assumed as a strong argument against the curculio theory.

It has also been common with many persons to attribute such blighting of the apple crop either to the cold of the preceding winter, or to east winds prevailing about the period when the orchards were in bloom.

It may be that both these conditions of the weather produce the deleterious effects attributed to them, but when we consider that a careful examination of weather tables, extending over a period of nearly or quite two hundred years, fixes the fact beyond dispute that the seasons of New England are unchanged in any important particular during that period, and also that the apple orchards have produced liberally notwithstanding severe winters and persistent east winds, we must perforce

admit that before these causes could be made to endanger seriously the fruitfulness of our trees, some change in the vital powers of the tree itself must have taken place to enable climatic influences which had always existed to work serious injury. It is an evil incident to the cultivation of exhausted soils, that the farmer is obliged to feed his crops of all descriptions with manures, concentrated and stimulating, in exact proportion to the degree in which the soil has been drained of its nutritive elements. This course, expensive as it may be, is essential to successful competition, with new soils, rich in the food which provident nature has carefully stored up for her own farming, but must, in accordance with the uniform action of the vital laws, tend to debility and disease. As a consequence of this system, those changes of climate and atmospheric influences, which were intended to promote health, may become, when acting upon the diseased plant, pernicious, and thus cause the destruction of our fruit. It has been maintained by some persons that the serious failures in fruit have been preceded by unusual quantities of snow, while the ground has remained unfrozen, and the experience of the past year may tend to confirm the observation. Somewhat extensive inquiries seem to point to two facts, which, although they may not be found to be universal, yet are too well established to be entirely overlooked. First, that ungrafted trees bore more profusely than those which had been grafted. Some instances of this occurred where native fruit was matured in comparative abundance, while the fruit of trees grafted with the same native fruit, and growing in close proximity failed entirely, while the proportion of native fruit growing in the pastures, and commonly used for the manufacture of cider, was very much greater than that of grafted fruit raised in cultivated grounds for the market.

The effects of the common method of cleft grafting, upon the health of the tree, has not received the attention which it deserves. A careful examination of many grafted limbs indicates the fact that the cleft made for the insertion of the scion never heals, but remains as a covered wound probably during the life of the limb, and the tongue by which it is fixed in its place remains within the cleft and very often decays there, and must always be a source of irritation as a foreign body. It is by no means unusual to find incipient decay connected with

the cleft in limbs which externally present a healthy and vigorous appearance.

There is another point in connection with this subject which deserves attention and thought, and with its consideration we shall close our report. It must be that large growing trees, like the apple and the cherry, which send strong roots deep into the earth, draw a portion of their nourishment from the subsoil far beyond the reach of the farmer. There can certainly be no good reason assigned why in the lapse of years this subsoil should not become much sooner exhausted in consequence of the stimulus applied to the tree by the application of concentrated manures, such as an artificial necessity, growing out of the demands of the market, now forces the cultivator to apply to the surface roots. These superficial organs cannot be roused into an unnatural degree of activity, without in time exciting a corresponding activity in the whole vital powers of the tree, and the lower roots must soon be called upon, by the necessity of preserving a healthy balance of action among the vital organs, to take up from the subsoil nutritive matter much faster than nature has provided for its supply. Hence the tree will first fail to be fruitful, and finally die. The fact has always been known that a young tree never flourishes vigorously, if placed in the same spot from which an old tree of the same kind has been recently removed, and upon the supposition just alluded to, this fact is readily understood. When to the exhaustion of the subsoil is added the injury done in many orchards by injudicious ploughing, the surface roots being often cut off and forcibly drawn out of the ground, it is not a matter of surprise that under such a system of operative surgery the patient should die of exhaustion before reaching maturity. Whatever may be the true explanation of the present and prospective failure of the fruit crop, it appears that we are to place but little reliance for our crop except upon comparatively young trees; and we can only secure these by combined resetting and removal of decaying trees; and it may yet be found profitable, although contrary to the commonly received doctrine, to depend to some extent upon thrifty suckers which spring from the roots of trees which the axe has removed.

Many fine trees could be pointed to, which have in this way taken the place of others, and having the benefit of large roots

at the outset, have grown vigorously, and come into bearing condition at a much earlier period than seedlings.

The committee make the latter suggestion as the result of their individual experience and observation.

JOHN C. BARTLETT.
HENRY H. PETERS.
EPHRAIM W. BULL.

DR. LORING of the Essex Society, presented the following

REPORT ON CATTLE BREEDING AND FEEDING.

The question of "the raising of cattle, with the cost in quantity and kind of food, and the breeds best suited to different purposes," seems to include the whole system of cattle husbandry; and is a matter of the deepest importance to every farmer. There is no branch of husbandry so universal, none more capable of yielding fair profits, none more important, none more dependent upon good farming, and none more likely to be attended by good farming when properly pursued. The value and utility of horses, no one questions. Of the profits and benefits of sheep husbandry in certain localities, no one can doubt. The hog, among some nations, has entered largely into the supply of animal food for man. But wherever man resides, whether civilized or savage, whether roving or stationary, whether on mountain pastures or in cultivated and luxuriant valleys, in good farming and in poor, in every spot where grass grows for cattle, and "herb for the service of man," there the herd attends him, and supplies him with food, and labor, and clothing, and the means of tilling the earth.

The breeding of cattle has occupied the attention of some of the most careful observers, and closest experimenters, in the list of active and progressive farmers. The labors of Bakewell, and the traditionary rules which guided him, still have their value. The name of Colling will endure, so long as the economy of farming requires a rapid production of beef, for the supply of populous markets. And wherever the dairy constitutes the chief agricultural business, the practical sagacity of Aiton will ever be remembered. Under the guidance of such men as these, the aboriginal cattle of England, those wild droves

in which a weight exceeding four hundred pounds was rarely reached, have been developed to those important breeds which are now of so much value to that kingdom, and have been scattered so widely over the globe.

And, in addition to this, the soil and climate of almost every region have aided the judicious agriculturist in developing a breed particularly adapted to local necessities. Not that soil and climate alone will do this. For it was not the valley of the Tees which brought the hard-hided, coarse-boned, thriftless, misshapen, lyery cattle of Holland,* and the profitless frames of Yorkshire, up to the perfection of modern improved Short-horns—it was a farmer of that valley, using the soil and climate, and breeding aright. So it was the intelligent farmers of Ayrshire, who adapted themselves to the agricultural capacity of that region, and raised the miserable cows of their hills to the superiority of their modern dairy animals. In neither case did they attempt to force a breed of cattle upon an uncongenial soil and climate. Mr. Aiton knew the value of the hills and vales of Scotland for dairy purposes. The Messrs. Colling understood how beef would grow, if properly planted, on the fat pastures of England. Let us imitate their example.

It is a disregard of the rules which they followed, in fact of all proper rules, which has brought confusion to the cattle-breeding of New England, and has rendered it thus far too much a profitless game of chance. Amidst the many wise and praiseworthy efforts which have been made to improve our herds, there has been a great deal of bad breeding, which, with

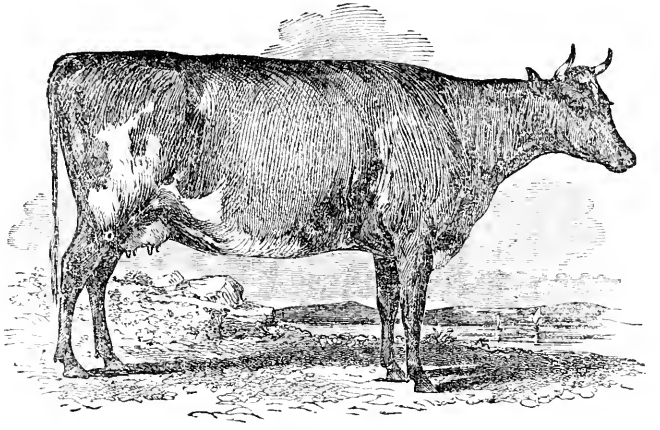
* "The Short-horned cattle, under which denomination are indiscriminately included the Dutch, Holderness and Teeswater breeds, are supposed to have acquired the appellation of Dutch, from a cross with some large bulls that were imported near a century ago from Holland into Yorkshire, in the east and north sidings of which county the two latter had been long established. It has, however, been doubted whether any advantage was derived from this intermixture; for the increase thus obtained in size was thought to have been counterbalanced by a more than appropriate increase of offal. But, fortunately, the error was not universal; for some intelligent breeders, aware even at that day of the superiority of symmetry to bulk, preserved the breed of which they were already in possession, in its native purity; and it is from some of that stock, so maintained, or, at least, from a cross between that stock and some of the progeny of the Dutch and Teeswater cross, that the present improved Short-horned cattle, are descended."—*Complete Grazier.*

bad feeding, has reduced the average of our stock to a very low standard. We have been led to believe that there may be somewhere an universal breed of cattle, suited to all purposes, of general excellence for the combined business of the dairy, the stall, and the yoke. And with the hope of arriving at this we have been groping in the dark, until we seem to have fairly lost our way. By undertaking too much, and without proper rule, we have, as usual, accomplished but little. Most of us can call to mind the unsuccessful efforts made in a region of short pastures and scanty food, to improve the stock by the introduction of a Short-horn bull—feeble cows and coarse oxen being the natural consequence. We have all seen a Jersey bull sent into a rich grazing region, and serving merely to glorify by contrast, the large and thrifty cattle already planted there. How many vain attempts have been made to introduce Ayrshires, with all their dairy qualities, into a luxuriant section, whose "paths drop fatness all around!" How much food have we seen wasted on misplaced Devons! "A place for every thing and every thing in its place," is the motto for cattle-breeders, who occupy such a diversity of soil and climate as ours. Amidst the general inferiority of our cattle, we find exceptions, where either wisdom or accident has produced a gratifying result. So true is this, that every sagacious purchaser of stock knows where to go in pursuit of choice animals. There are certain towns, certain counties, certain valleys of rivers, in New England, which have become noted for their fine cattle, and whose reputation has been established, by the fortunate introduction of blood well adapted to the place.

There is no doubt that our cattle need improvement, both by breeding and by feeding. Whatever may have been the origin of our so-called natives, they have become a mass of confusion, without any distinctive features which would give them value, and without any certainty of transmitting even the good qualities which they do possess. Large numbers of cattle are raised among us, which in no way remunerate the raiser or feeder, even when the cost of keeping until ready for market, is estimated at the lowest possible figure.

We are too apt to breed badly. Sufficient care is not always used in selecting the female, in the first place. A cow that happens to be a good milker, in spite of many bad points, and

without any known good ancestry, is expected to produce good heifer calves. Without much care for the male, we set her at the work—she transmits her poor qualities, perhaps increased by the sire, and her good ones disappear. A large cow is selected for the purpose of raising oxen, her size being her only recommendation. She may be a bad feeder, a bad handler, a bad mover, in fact deficient in those very points which render an ox good for the yoke and the stall. We breed from her, and she disappoints our expectations. We choose a good cow for choice breeding, unmindful of the quality of the bull which has been previously coupled with her; and we are astonished, and mortified, and discouraged, to find that she produces any thing but what we desired and expected.



Ayrshire Cow, "Jessie."

BREEDING,—THE FEMALE FOR THE DAIRY.

If we would improve our native stock, therefore, we should begin by a careful selection of females, from the best herds already established, care being taken to consider always the objects we have in view. No matter what the yield of milk from a cow may be, she should not be selected for a breeder, unless she possesses as an inheritance, that shape which indicates strong vitality, and that quality which indicates active secretory functions. She should have—*Head* of medium size, with a strong, well-marked, bony structure, broad between and high above the eyes, and wide between the roots of the horns, with a capacious but not clumsy muzzle, full nostril,

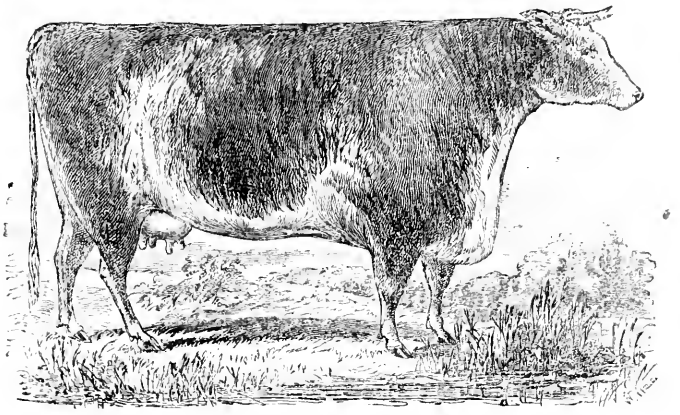
an eye full, mild, not too large and prominent, jowls thin and wide, horns small, well-curved, clear, slightly turned upwards, —and with a calm, and at the same time strong and resolute expression; neck long, well-muscled, slender, tapering towards the head, with little loose skin hanging below, and not dropping too much forward of the shoulders; *shoulders* thin and sharp at the top, and lying close to the chine, somewhat prominent, strong-muscled, and loose-jointed at the point, (the head of the humerus,) long from the point to the elbow; *fore-quarters* light and thin, with straight and slender fore-leg, broad knee, and broad, flat, capacious foot; *carcase* deep, round and full about the heart, and increasing largely towards the hind-quarters; *back* straight and loosely jointed; *pelvis* wide over the hips, long, and supplied with strong muscles; *hind-quarters* broad, strong on the outside, and well cut out inside, with strong hock, and a long tapering foot; *tail* long and slender, strong at the roots, and set on in a line with the back; *udder* evenly divided into four quarters, extending well forward, filling the cavity between the thighs behind, not hung low, and with a large, long, and crooked milk-vein; *teats* set far apart, and of medium size and length; *skin* loose and elastic, but not too thin; *hair* soft and silky, and of lively appearance; *ribs* broad and flat, and, especially the two last, widely separated. A yellowish color to the skin, especially that lining the ears and about the eyes, is desirable.

A good cow should possess the appearance of strength and firmness, without being too compact; and she should present no palpably weak point, if she is expected to endure well, in the work of the dairy. With regard to the size best suited for dairy purposes, opinions differ materially—but on our ordinary New England pastures, a cow that will dress, in fair condition, six hundred pounds, seems to be the most appropriate.

THE FEMALE FOR BEEF.

In selecting females for the breeding of beef cattle, we must not be governed by the rules laid down for the dairy. There should be greater roundness of bone; the shoulders should be closer, firmer, thicker at the top, and the fore-quarter generally more substantial, bearing about the same relation to that of the dairy cow, that the shoulder of a draught-horse bears to that of a

trotting horse. The brisket should be deeper, the body more uniform, and the head smaller in proportion to the body. Perhaps Youatt's description of such an animal is the best that can be given, although, as will be seen, he applies it to both



Short-horn Cow, "Duchess."

males and females. He says: "The animal should have wide and deep girth about the heart and lungs; and not only about these, but above the whole of the ribs must we have both depth and roundness; the *hooped* as well as the deep barrel is essential. The breast should also be ribbed home; there should be little space between the ribs and the hips. This is indispensable in the fattening ox, but a largeness and drooping of the belly is excusable in the cow. It leaves room for the udder, and if it is also accompanied by swelling milk-veins, it generally indicates her value in the dairy. This roundness and depth of barrel, however, is most advantageous in proportion as it is found behind the point of the elbow, more than between the shoulders and legs; or low down between the legs, than upwards towards the withers; for it diminishes the heaviness before, and the comparative bulk of the coarser parts of the animal, which is always a very great consideration.

"The loins should be wide, for these are the prime parts; they should seem to extend far along the back; and although the belly should not hang down, the flanks should be round and deep, the hips large, without being ragged, round rather than wide, and present when handled, plenty of muscle and

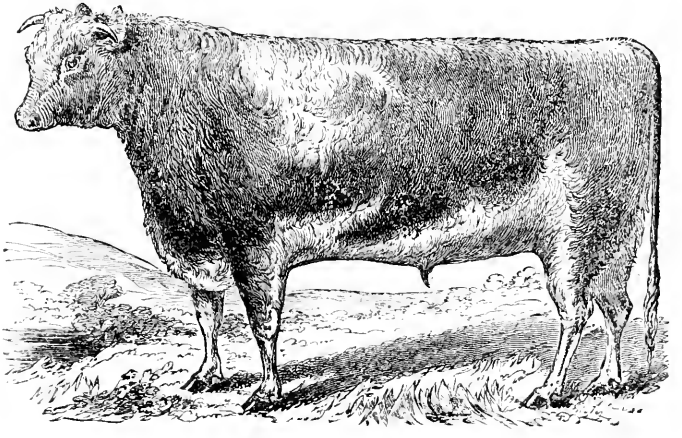
fat; the thighs full and long, and when viewed from behind, close together; the legs short, for there is an almost inseparable connection between length of leg and lightness of carcase, and shortness of leg and propensity to fatten. The bones of the legs and of the frame generally, should be small, but not too small—small enough for the well known accompaniment, a propensity to fatten; small enough to please the consumer, but not so small as to indicate delicacy of constitution, and liability to disease. Finally, the hide, the most important thing of all, should be thin, but not so thin as to indicate that the animal can endure no hardships; movable, mellow, but not too loose, and particularly well covered with fine and soft hair."

Guided by these rules, the breeder can select females adapted to either of the two objects specified, or, if he desires it, to both combined, so far as that is practicable.

If he expects to breed with any degree of certainty, he should choose females that have never been coupled with the bull. Of course, in making the selection, regard should be had to the blood as well as to the quality of the animal; and even with the utmost caution, it cannot be expected that every heifer will fulfil her promise as a breeder. She may transmit just those qualities of her ancestry, which she herself has escaped.

But whatever may be her qualities, she cannot be used for breeding in one direction, after she has been used for breeding in another. A cow, therefore, which has borne calves by one bull, cannot be safely used for breeding purposes with another, unless it be desirable to preserve in some degree in her progeny, the qualities of the former bull. So many facts going to substantiate this theory are recorded, that it seems hardly necessary to dwell upon it further. The well-known instances of the Arabian mare belonging to the Earl of Morton, which after having been covered by a quagga, produced colts by thoroughbred horses with the marks of the quagga upon them—of the mare of Mr. Morrison, which, after having borne a mule, gave to her colts, sired by stallions, the marks of the mule—of the Aberdeenshire heifer, which produced her first calf from a Teeswater bull, and gave subsequent calves by Aberdeenshire bulls, the long horns of the Teeswater—of ewes tainted in their first coupling by the ram,—

are sufficient to satisfy any one that females thus impressed cannot be properly used for breeders. And it is very doubtful whether a female may not be thus impressed, any time during her breeding life, by a bull of stronger blood than her own. We have seen an Ayrshire cow, which, after having brought three calves by an Ayrshire bull, was coupled with a Jersey, and all of whose subsequent calves bore distinct marks of the Jersey—the older and stronger blood of the male having gained an ascendency. And we have heard many a careful and enterprising farmer wonder that the progeny of his superior cows, bore the marks of the common and inferior bull, with which they were thoughtlessly coupled, in early life, notwithstanding the care he had afterwards taken. It is, indeed, possible that this obstacle may be overcome by two or three generations of breeding; but time may be saved and the difficulty avoided, by a little trouble in the beginning. The expense will be amply repaid.



Short-horn Bull, "Double Duke."

THE BULL.

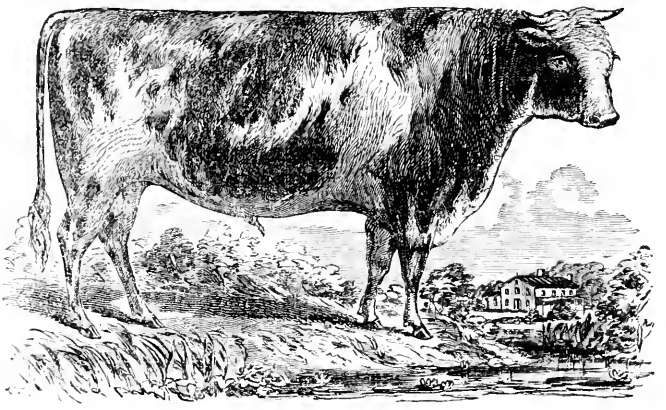
There is no doubt that the stock of New England has suffered more from the use of inferior and badly bred males, than from inferior and badly bred females. The bull is usually looked upon as the least profitable animal on the farm. He is treated as an outcast, and his presence is too often considered a necessary calamity. His immediate benefit is not perceptible. He neither earns his living by labor, nor by the

growth of such a quality of beef as is remunerative in the market. He is viewed with a certain degree of dislike in his youth, and is not allowed to reach mature years, through fear, that in his strength, he may repay the insults and injuries received in his weakness. He is purchased for nothing, at a time of life when he is good for nothing; and sold for nothing, because he is considered to have done all that was expected of him. Nobody thinks of paying much for his services; and the longer he lives the larger is the account against him, which his owner is eager to settle summarily and finally.

Now it is this despised animal, which is hurried out of existence before he has had time to develop his own qualities, or to give any mature evidence of what he can transmit, which has the most important part to perform in the business of cattle breeding. It is undoubtedly true that the inferiority or superiority of the male, rather than of the female, affects the quality of the offspring. A superior herd can be injured by an inferior bull; an inferior herd can be improved by a superior bull. There is no doubt that the female imparts important qualities to the offspring — perhaps vitality, constitution, the nutritive functions. But all experience goes to prove that we stand a better chance of securing good offspring from a good male and an inferior female, than we do from an inferior male and a superior female. This, in addition to the fact that the male has a larger sphere of operations than the female, shows the vast importance of a careful selection of the former. It seems, moreover, that through the male, the strongest ancestral qualities are transmitted. "Show me the bull's mother," said the Scotchman, when called upon to pass judgment upon his neighbor's newly-purchased animal.

It was the dam of Hubback, which possessed that remarkable aptitude to fatten, which distinguish the breed of Improved Short-horns. But it was Hubback himself, which transmitted this quality to a long line of descendants, and laid the foundation of this remarkable family. It is to Comet, and Red Comet, and Roan Duke, and Swinley, and Cardigan, among cattle; to Messenger, and Justin Morgan, and Black Hawk, among horses, that we are indebted for the improvements which have been made among these different classes of animals. For it is by them that good ancestral qualities have been trans-

mitted and diffused. And, dependent as we are upon the quality of the female, upon those qualities which will best unite with and develop the qualities of the male, it is to the latter that we are to look for the advancement we are to make in breeding. Hence the fabulous prices paid for males of all animals which are bred for the farm; hence the large incomes of the pioneers in breeding, for the use of the males, — Mr. Bakewell having received $30,000 in one year for the use of his rams, and the Messrs. Colling having received equally exorbitant prices for the use of their bulls — facts which our farmers should remember, when they are willing to keep bulls for the service of which they do not expect to receive a remunerative price. There is no more profit in using a poor bull, than there is in keeping a poor cow.



Ayrshire Bull, "Albert."

In selecting a bull, regard should be had, of course, to the object of breeding, this being decided by climate, soil, and location. The description already given of the dairy cow, will apply somewhat to the bull. Mr. Aiton remarks, that "the Ayrshire farmers prefer their dairy bulls according to the feminine aspect of their heads, necks, and fore-quarters, and wish them not round behind, but broad at the hoop-bones and hips; and they like them best that are full in the flank." It is particularly important that shelliness of skin and roundness of buttock should be avoided. There is no end to the mischief

which such animals may produce, whether used for the dairy or the stall. This is well illustrated by Culley, who, in speaking of the successful efforts of Mr. Dobinson, in breeding Short-horns and importing blood from Holland, says:—

"But afterwards *some other persons of less knowledge*, going over, brought home some bulls that introduced the disagreeable kind of cattle called lyery, or double lyered,—that is, black-fleshed. These will feed to great weight, but though fed ever so long will not have a pound of fat about them, neither within nor without, and the flesh (for it does not deserve to be called beef) is as black and coarse-grained as horse flesh. No man will buy one of this kind, if he knows any thing of the matter; and if he should be once taken in, he will remember it well for the future. People conversant with cattle very readily find them out by their round form, particularly their buttocks, which are turned like a black coach-horse, and the smallness of the tail; but they are best known to the graziers and dealers in cattle by the *feel or touch* of the fingers; indeed it is this nice touch or feel of the hand that in a great measure constitutes the judge of cattle."

In fact, the nearer the bull comes, in dairy breeding, to the points of a good cow, the better. And, in this branch of husbandry, the male should not much exceed the female in size.

For other purposes, as well as in some degree for this, the following description, taken from the "Complete Grazier," will be found useful and instructive:—

"A bull, then, ought to be the most handsome of his kind; he should be tall and well made; his head should be rather long, but not coarse, as fineness of head indicates a disposition to fatten; and as it is designed by nature to be the chief instrument both of offence and of defence, it ought to present every mark of strength; his horns, clean and bright; his large black eyes, lively and protuberant; his forehead, broad and close set, with short, curled hair; his ears, long and thin, hairy within and without; muzzle, fine; nostrils, wide and open; neck, strong and muscular, not incumbered with a coarse wreathy skin, but firm, rising with a gentle curve from the shoulders, tapering to the part where it is connected with the head; dewlap thin, and but little loose skin on any part. His shoulders should be deep and high, and moderately broad at the top; the bosom open; breast large, and projecting well before his legs; back straight and broad, even to the setting on of the tail, which should not extend far up the roof, but be strong and deep, with much lank hair on the under part of it; ribs broad and circular, rising one above another,

so that the last rib shall be rather the highest; the fore thighs strong and muscular, tapering gradually to the knees; the belly deep, straight, and also tapering a little to the hind thighs, which should be large and square; the roof wide, particularly over the chine and hips, or hooks; the legs straight, short-jointed, full of sinews, clean, and fine boned; knees round, big and straight; feet distant one from another, not broad, nor turning in, but easily spreading; hoofs long and hollow; the hide not hard nor stubborn to the touch; the hair uniformly thick, short, curled, and of a soft texture; and the body long, deep, and round, filling well up to the shoulder and into the groin, so as to form what has not improperly been termed a round, or *barrel-like* carcase."

PURE BLOOD.

Let the object of the breeder be what it may, he cannot expect to arrive at any degree of perfection without the use of a full-blooded male, of the breed which he has chosen. This rule has been strongly urged by some of the best farmers in England, and has so far attracted attention in this country, that premiums are offered for no other bulls by some of the agricultural societies of Massachusetts. And, after having chosen a bull of any breed, whose progeny proves satisfactory, it is undoubtedly judicious to obtain, in changing, for purposes of future breeding, a bull of similar strain of blood. If a farmer has a herd of grade cows, the product of a pure bull of any breed, he can improve the quality of his stock with more rapidity and certainty, by the use of a bull somewhat nearly allied to the sire of this herd, than in any other manner. Perhaps this is not desirable, if he has in view the immediate sale of his animals, rather than the improvement of his stock. But constant crossing keeps the breeder always just where he began, especially if the cross is in any way violent—as between a cart horse and a thorough-bred, or between a Jersey and a grade Devon. It is close breeding which has produced our best breeds of cattle, horses, and sheep; and if it stops at such a point that the health and strength of the offspring are not endangered, it is the only means by which we can establish a reliable and valuable breed among us. We have numerous instances in which small families of cattle in New England have been brought to a high degree of perfection by close breeding, combined with good feeding. And what is done on a small scale may be done on a large one. There is no doubt

that the first fruits of a judicious cross may be very profitable and valuable; but if these fruits are at once indiscriminately commingled, the poorer qualities of either parent may at once gain the ascendency, and the benefits of the first crossing may be entirely destroyed. This may also be done by an injudicious cross, brought into the herd from blood of another strain. Let me illustrate. If I had a dozen cows sired by Kirkleavington, and I found that the cross had many valuable qualities, which I wished to perpetuate and develop more fully, I should have more confidence in the ability of a good bull, distantly related to Kirkleavington, to improve my stock still further, than I should in a bull having nó connection whatever with this family. These views differ somewhat, I know, from some modern theories; but I know of no better rule for the production of uniform excellence, and the ultimate production of powers worthy of transmission. We have so little pure breeding in this country, and so much time has been wasted by incessant crossing, that perhaps the rule laid down would be more advantageous to us, than to breeders who can avail themselves of selections of pure blood at any time and from large supplies. In adopting this principle, moreover, it should be satisfactorily ascertained that the qualities obtained are valuable, and worthy of transmission.

The following remarks, from a writer on cattle in the "Library of Useful Knowledge," although differing somewhat from the foregoing, and although often quoted, are so useful, that they are well worthy of insertion in every treatise on breeding. He says:—

"At the outset of his career the farmer should have a clear and determined conception of the object which he wishes to accomplish. He should consider the nature of his farm; the quality, abundance or deficiency of his pasturage, the character of the soil, the seasons of the year when he will have plenty, or deficiency of food, the locality of his farm, the market to which he has access, and the produce which can be disposed of with the greatest profit; and these things will at once point to him the breed he should be solicitous to obtain. The man of wealth and patriotism may have more extensive views, and nobly look to the general improvement of cattle; but the farmer, with his limited means, and with the claims that press upon him, regards his cattle as a valuable portion of his own little property, and on which every thing should appear to be in natural keeping, and be turned to the best advantage.

The best beast for him is that which suits his farm the best, and with a view to this, he studies, or ought to study, the points and qualities of his own cattle and those of others. The dairyman will regard the quantity of milk—the quality—its value for the production of butter and cheese—the time that the cow continues in milk—the character of the breed for quietness, or as being good nurses—the predisposition to garget or other disease, or dropping after calving—the natural tendency to turn every thing to nutriment—the ease with which she is fattened when given up as a milker, and the proportion of food requisite to keep her in full milk or to fatten her when dry. The grazier will consider the kind of beast which his land will bear—the kind of meat most in demand in his neighborhood—the early maturity—the quickness of fattening at any age—the quality of the meat—the parts on which the flesh and fat are particularly laid—and, more than all, the hardihood and the adaptation to soil and climate.

"In order to obtain these valuable properties, the good farmer will make himself perfectly master of the characters and qualities of his own stock. He will trace the connection of certain good qualities and certain bad ones, with an almost invariable peculiarity of shape and structure; and at length he will arrive at a clear conception, not so much of beauty of form, (although that is a pleasing object to contemplate.) as of that outline and proportion of parts, with which utility is oftenest combined. Then carefully viewing his stock, he will consider where they approach to, and how far they wander from this utility of form; and he will be anxious to preserve or to increase the one, and to supply the deficiency of the other. He will endeavor to select from his own stock those animals that excel in the most valuable points, and particularly those which possess the greatest number of these points, and he will unhesitatingly condemn every beast that manifests deficiency in any one important point. He will not, however, too long confine himself to his own stock, unless it be a very numerous one. The breeding from close affinities has many advantages, to a certain extent. It was the source whence sprung the cattle and sheep of Bakewell, and the superior cattle of Colling; and to it must also be traced the speedy degeneracy, the absolute disappearance of the New Leicester cattle, and, in the hands of many agriculturists, the impairment of constitution and decreased value of the New Leicester sheep and of the Short-horns. He will therefore seek some change in his stock every second or third year, and that change is most conveniently effected by introducing a new bull. This bull should be of the same breed, and pure, coming from a similar pasturage and climate, but possessing no relationship—or at most a very

distant one*—to the stock to which he is introduced. He should bring with him every good point which the breeder has labored to produce in his stock, and, if possible, some improvement, and especially in the points where the old stock may have been somewhat deficient, and most certainly he should have no manifest defect of form; and that most essential of all qualifications, a hardy constitution, should not be wanting.

"There is one circumstance, however, which the breeder occasionally forgets, but which is of as much importance to the permanent value of his stock, as any careful selection of animals can be—and that is, good keeping. It has been well said that 'all good stock must be both bred with attention and well fed.' It is necessary that these too essentials in this species of improvement should always accompany each other; for without good resources of keeping, it would be vain to attempt supporting a valuable stock. It is yet more evident when animals are absurdly brought from a better to a poorer soil. The original stock will deteriorate if neglected and half-starved, and the improved breed will lose ground even more rapidly, and to a far greater extent."

NEW ENGLAND CATTLE FOR MIXED PURPOSES.

While a distinction has been drawn between the breeding of animals for beef, and for the dairy, in the suggestions that have already been made, there is no doubt that the two objects can be combined to some extent. "It is probable," observes Sir John Sinclair, "that, by great attention, a breed might be reared, the males of which might be well calculated, in every respect, for the shambles; and the females of which might, when young, produce abundant quantities of good milk; yet when they reached eight or nine years of age might be easily fattened. This would be the most valuable breed that could be propagated in any country; and, indeed, some of the best English and Scotch breeds have almost reached that point of perfection."

In New England also, there has, in some sections, been some approach to this. With all the existing diversity in our cattle, there are, scattered in every direction, and without any known relationship, small families, not constituting in any respect a breed, which combine size and thrift, with very good qualities for the dairy. There can hardly be said to be any great

* On this point we differ somewhat; distant relationship, if sound, and possessed of valuable points, it seems to us, will bring about the desired result, with more rapidity and certainty.

uniformity among the individuals of any one of these families—only a certain pervading excellence, good dairy cows, not perhaps those which can be most economically and profitably fed for the dairy, nor those which will bring to the stall the highest fattening qualities—but pretty good animals in both capacities. These families of cattle bear no marks of having descended from the same origin. In some instances, they appear to be grade Devons, the cross, whatever it may be, having imparted larger growth, more bone, and heavier quarters, than are seen in pure animals of this breed in this country. In other instances, the prevailing type is that of the old-fashioned Durhams, like the Gore and Derby stock, or Cœlebs, rather coarse and ill-favored animals, sometimes denominated Holderness. In other places, there are evident marks of Ayrshire blood, either derived from some long-forgotten Ayrshire bull, or resembling that breed from an accidental cross, somewhat analogous to that adopted by the Scotch farmers in establishing their well-known dairy stock. It is hardly proper to denominate these various families, as the native breed of New England, because, although some of them were founded at a time and in a manner long since forgotten, yet others are of modern and well-remembered origin, and all differ from each other very essentially.

It is, indeed, very difficult to account for the want of similarity in our New England cattle. It may be owing to the variety of the importations which have been made from time to time—Short-horns, Durhams, Ayrshires, Devons, Jerseys, just as the taste of the importer might dictate. But while most other sections have types of their own, sprung perhaps from one early introduction, and not interfered with for many generations, while in the old country, the Devon, and Hereford, and West Highlander, and Galloway, and Suffolk, and Jersey, and Short-horn, are preserved with purity, although in nearer proximity, than the cattle of the Aroostook are to those of the Connecticut Valley, we have neither established an uniform New England breed, nor have given to each locality such a distinct breed that the experienced eye can detect the origin of the droves that congregate in our markets. We seem not yet to have learned what breed of cattle is best adapted to our wants. We have not yet discovered what animal machine will

convert our farm products into the most money. If we had done this, we should not see one farmer devoting himself to producing the mammoth proportions of the Short-horn, while his immediate neighbor is satisfied with the Devon, or the Ayrshire, or the Jersey. It is very evident that the same tract of land cannot be fed indiscriminately with all these breeds, with an equal prospect of success, and with equal results. As our agriculture advances, this defect will undoubtedly find a remedy.

METHODS OF REARING.

With regard to the best methods of rearing cattle, much depends upon the prices of food consumed by them in various localities; upon the manner of feeding; and upon the time occupied by them in arriving at maturity. A large proportion of the expense may be incurred during the first few months, in the period of calf-hood, when the animal requires good nourishment, and tender care, in order to start it well in life, and to lay a foundation for future usefulness. No statement of the various modes of feeding the calf, can be more comprehensive than the following, taken from the "Complete Grazier":—

"There are two modes of feeding calves: one is to permit them to run about with the parent cow the whole of the first year; the other mode is to wean them when about a fortnight old, and bring them up by hand.

"The former expedient is generally allowed to be productive of the best cattle, and is adopted in those countries where fodder is abundant and cheap; in others, where it is found prudent to reserve a portion of the milk, the following plan is pursued. From the time the calves are dropped, till they are able to support themselves, they are allowed to run in the manner above mentioned, but they are prevented from sucking by means of a small piece of leather, having little sharp iron spikes fixed upon the outside, which is tied on the upper part of the calf's nose, in such a manner as to allow it to feed upon the grass without restraint. Hence, as often as the animal attempts to suck, this instrument pricks the cow, and prevents her from letting the milk flow, till the muzzle is removed, and the portion of milk not taken from the cow is resigned to the calf, and the muzzle is replaced.

"Whether calves are designed to be raised for breed, labor, or feeding, care should be taken that they have a sufficient supply of good pasture;

because, if the latter be scanty at first, they scarcely, if ever, attain to a large growth. The best time for weaning them is, therefore, about that period of the year when the young grass acquires enough succulence, both to entice the appetite, and to afford complete nourishment without the aid of other food. Calves, which are dropped in October and November will thrive greatly by the nourishing pastures into which they may be turned, in the ensuing spring, if allowed to suck and to be properly sheltered throughout the winter; but the milk is too scarce at that season to be commonly bestowed on them, and winter-weaned calves seldom arrive at much perfection."

I would here remark, that some of the best and cheapest calves that I have ever raised, have been dropped in the autumn. They require good care; but they are very likely to get it in winter, when there is no temptation to turn them to grass, too early. And they are well matured for the nourishing grass of spring.

"Various plans have been suggested, and tried with considerable success, for rearing calves without any, or at least with a small quantity of milk. The time of weaning them varies from one fortnight till they are seven weeks old; but the latter period is preferable, on account of the weak and tender state of the calves, if separated from the dam at an earlier age. In several counties of England, calves, on being taken from the cows, are with great pains taught to drink skimmed milk, in a luke-warm state; for either extreme of heat or cold is hurtful to the beast, and not unfrequently produces fatal consequences; about twelve weeks after which, for three or four weeks they are fed with lukewarm milk and water. Small wisps of fine hay are then placed within their reach, in order to induce them to eat. Towards the end of May they are turned out to grass, being taken in a few nights, when they have tepid milk and water given them; which is usually continued, though gradually in smaller proportions, during the last month, till they are able to feed themselves, when they totally disregard it; care, however, should be taken that the grass is short and sweet, and by no means rank and sour. Indeed, a spirited American agriculturist (Mr. E. L. Hommedieu, Transactions New York Agricultural Society) is of opinion that calves taken from the cows are much better in a pasture without water than in a pasture of equal goodness with water. The reason he assigns (with which, however, we can by no means agree) is, that when indulged with water they drink too much to supply the want of milk; whereas, when deprived of water they are forced to eat grass, containing some

moisture, and soon learn to allay their thirst by eating before the dew is dissipated, and on that account eat more than if they could go to water.

"In the county of Suffolk, calves are usually weaned soon after Christmas; when they are fed with lukewarm skimmed milk and water, having bran or oats in it, and some very sweet hay by them, till the grass is ready; though if the farmer have carrots, these form an excellent article of food, and render the use of oats unnecessary. About two gallons of milk daily are sufficient for the support of a calf until he begins to eat. It should be given regularly at the same hours; and he should be kept as quiet as possible, as rest is found to promote his growth materially.

"In Ayrshire, calves intended to be reared for dairy cows are fed on milk for the first four, five, or six weeks, and are then allowed four or five quarts of new milk at each meal, twice in twenty-four hours. Some never give them any other food when young except milk, and lessen the quantity when they begin to eat grass, or other food, which they generally do when about five weeks old, when grass can be had; and the milk is wholly withdrawn about the seventh or eighth week. But if reared in winter, or before the grass rises in spring, they must be longer supplied with milk, as a calf will not so soon learn to eat hay or straw, nor thrive so well on them alone as it will on pasture. Others feed partly with meal mixed in the milk, after the third or fourth week; or gradually introduce some new whey along with the meal, and afterwards withdraw the milk altogether. Hay-tea, linseed jelly, treacle, &c., are also sometimes used with advantage; but milk, when it can be spared, is by far the best as well as the most natural food.

"Another mode of rearing calves has been suggested by his Grace, the late Duke of Northumberland, the design of which is to render the use of new milk unnecessary, while the expense is reduced in the proportion of two-thirds. It is effected in the following manner: let half an ounce of common treacle be well mixed with a pint of skimmed milk, then gradually add one ounce of finely powdered linseed oil cake, stirring it until the mixture be properly incorporated, after which it is to be added to the remainder of a gallon of milk; and the whole, being made nearly of the temperature of new milk, may then be given to the animal; after a short time, the quantity of pulverized oil cake may be increased. This method is said to have been advantageously adopted; but Lord Egremont has used linseed jelly, in the proportion of a pint to a gallon of skimmed milk, without treacle, and it did not answer.

"An infusion of hay, called indiscriminately hay-tea or hay-water has been also applied to the purpose of rearing calves with the smallest quantity of milk. In order to make this infusion, such a portion of fine, sweet hay cut once or twice, is put into a small earthen vessel, as will

fill it, on being lightly settled with the hand. The vessel is then filled with boiling water, and carefully closed; at the end of two hours, a brown, rich, and sweet infusion will be produced, not unlike alewort, or strong tea, which will remain good for two days, even during summer, and which is to be used in the following manner.

"At the end of three or four days after a calf has been dropped, and the first passages have been cleansed, let the quantity usually allotted for a meal be mixed, consisting for a few days of three parts of milk, and one part of hay-tea; afterwards the proportion of each may be equal; then composed of two-thirds of hay-water and one of milk; and, at length one-fourth part of milk will be sufficient. This preparation (the inventor of which was, many years since, honored with a gold medal by the Dublin Society of Arts,) is usually given to the calf, in a lukewarm state, in the morning and evening; each meal consisting of about three quarts at first, but gradually increasing to four quarts by the end of the month. During the second month, beside the usual quantity given at each meal, (composed of three parts of the infusion, and one part of milk,) a small wisp or bundle of hay is to be laid before the calf, which will gradually come to eat it; but if the weather be favorable, as in the month of May, the beast may be turned out to graze in a fine, sweet pasture, well sheltered from the winds and sun. This diet may be continued till towards the latter end of the third month, when, if the animal graze heartily, each meal may be reduced to less than a quart of milk, with the hay-water; or skimmed milk, or fresh butter-milk, may be substituted for new milk. At the expiration of the third month, the animal will scarcely require to be fed by hand; though if this should still be necessary, one quart of the infusion (which during the summer need not be warmed,) will be sufficient for a day.

"The economical mode above detailed has been adopted in some counties of England, with the addition of linseed-cake finely pulverized and boiled in the hay-tea only, to the consistence of a jelly, without employing any milk in the mixture; and as so many excellent artificial grasses are now cultivated for the feeding and fattening of cattle, we conceive that an infusion of any one or more of them would be found more nutritious than if it were prepared from the promiscuous mixtures of grass usually occurring in common hay.*

* Mr. Crook, (in the Letters and Papers of a Bath and West of England Society,) is said to have great success with this method. Three sacks of linseed lasted him three years—value eleven dollars. One quart of seed boiled in six of water, for ten minutes, to a jelly, was given three times a day mixed with a little hay-tea. His cattle were remarkably fine.

"In Devonshire, the rules commonly followed in rearing calves, are nearly as follows: The greatest number are usually dropped between Candlemas and May, and some much later; but the most experienced breeders prefer the earliest. They are permitted to suck as much as they like, three times a day, for the first week, after which they are suckled by hand, and fed with warm new milk for three weeks longer. They are then fed, during the two following months, twice a day, with as much warm skim milk as they can drink—in which some breeders mix a small portion of finely pounded linseed cake,* or meal; after which the meals of milk are gradually abated, and at the end of four months they are wholly weaned from milk, and left to themselves at pasture.

"In the northern counties of England, it is a common practice to give the calves equal parts of milk and sweet whey, made lukewarm; but as this mode often produces scouring or looseness, we think the following method, which was a few years since communicated to the public by a spirited and experienced breeder, is greatly preferable. For the first four or five weeks, he fed them regularly, but oftener than is usually done, with new and skimmed milk, at the end of which time his calves were gradually taught to drink strong water-gruel, consisting of equal parts of bean or oat-meal, mixed with the gruel after the latter is removed from the fire. This method of treatment he is stated to have pursued with great success for many years; his calves being strong and healthy, while every thing that could tend to retard their growth was effectually prevented.

"In the county of Norfolk, calves are fed with skimmed milk, in which is mixed a little wheaten flour; they have also chopped turnips in a trough; and some hay in a low rack. As soon as these animals learn to eat turnips freely, they are no longer supplied with milk, these roots, with the addition of a little hay, furnishing them both with food and drink. The period of raising calves in the above mentioned county, is from the first of October to the first of February; but the time of feed-

* Lest we should be understood as indiscriminately recommending the use of linseed as food for calves, either in form of infusion or of ground oil cake, we would say that its use in the rearing of dairy stock, cattle for labor, or for store, should be avoided. We are of opinion that its use once begun cannot be discontinued; and that while it forces the animal to early maturity, and keeps it in high condition, profitable to the breeder of beef, still it is injurious to certain faculties and functions necessary to be preserved in animals whose service begins at a later period of life—such as the dairy cow, and the working ox. This matter is more fully discussed in the following pages. The remarks applied to linseed, we would also apply to all articles of food, of a highly stimulating and fattening nature.

ing them wholly with turnips varies, according to circumstances or accident. Where there are older calves that have been accustomed to these roots, the younger ones soon acquire the method of breaking and eating them, by picking up the fragments left by the former.

"Towards the month of March, those which are first reared are turned out among the fattening bullocks during the day, and are sheltered in the night; though, if the weather proves favorable, they are in a few days turned out altogether. In the succeeding summer they are kept in clover, or other luxuriant grasses, and the following autumn, are sufficiently strong to stand in the straw or fold-yard. This circumstance is considered the chief advantage to be derived from rearing calves early in the season; as those which are raised during the spring require two years' nursing.

"The subsequent method of raising calves, by Mr. William Budd, of Boston, Massachusetts, which obtained the prize from the 'Massachusetts Society for promoting Agriculture,' we give in his own language, extracted from his communication to that Society:—

"'Take calves, when three days old, from the cows, and put them into a stable by themselves; feed them with gruel, composed of one-third barley, two-thirds oats, ground together very fine, sifting the mixture. Each calf is to receive a quart of gruel morning and evening, and to be made in the following manner; to one quart of the flour, add twelve of water, boil the mixture half an hour, let it stand until milk-warm. In ten days, tie up a bundle of soft hay, in the middle of the stable, which they will eat by degrees. A little of the flour put into a small trough, for them to lick occasionally, is of service. Feed them thus, till they are two months old, increasing the quantity. Three bushels of the above mixture will raise six calves.'

"Mr. Clift, of the New York Agricultural Society, takes the calf from the cow at two or three days' old; he then milks the cow, and while the milk is warm, teaches the animal to drink, by holding his head down into the pail; if the calf will not drink, he puts his hand into the milk, and a finger into the mouth, till the beast learns to drink without the finger. After he has been fed with new milk for a fortnight, the cream is taken off the milk, with which an equal or larger portion of thin flax-seed jelly is mixed, and the whole is given milk-warm. Thus, as the spring is the most favorable season for making butter, he is enabled, during the six or seven weeks the animals are kept previously to weaning, to make as much butter as they are worth; a practice which merits the attention of our farmers, to whom it will afford a very essential saving, particularly in those counties where butter forms a chief article of manufacture.

"In the rearing of calves, much depends on the regularity of feeding them; the common practice is to supply them with food twice in the

day, in the morning and at evening, when they generally receive as large a quantity as their craving appetites can take. Hence the digestive organs are necessarily impaired, and numerous animals either become tainted with disease, or perish from the inattention of their keepers; whereas by feeding them thrice a day, at equidistant intervals, and allowing sufficient room for exercise, (when they are not intended to be fattened,) they will not only be preserved in health, but they will also greatly improve in condition.

"Whatever food be allowed to young calves, care should also be taken not to change it too suddenly. A calf must have attained a certain degree of strength before it can dispense with the food most natural to its age, and thrive without the aid of milk; it should always, therefore, be allowed as long as possible; but even when that has been withdrawn, and the animal has begun to eat grass, still the substitutes that had been employed in lieu of milk should be partly continued until his appetite prefer the pasture. It is a common notion, that provided young stock acquire size, their condition is immaterial; and, after the first winter, they are generally turned into the toughest pasture, and kept during the following winter on straw, with, perhaps, a little indifferent hay. This, when they are intended to be sold to the fatting grazier, may be the most profitable mode, and, in some situations, it is the only one that can be adopted; but when they are meant to be reared for the breed, it is absolutely requisite, as the only means of bringing them to perfect maturity, and improving their qualities, that they should be kept on good pasture during the summer, and allowed roots with some sound hay in the winter, and green food in the spring. A contrary mode, though the most economical, is decidedly disadvantageous; for the worst breed will ultimately be improved by good feeding, while the best will degenerate under a system of starvation."

In most of these modes of feeding, it will be observed that the great object in view is the raising of cattle, without interfering with the products of the dairy. That this is desirable will be seen at once, when we estimate the amount of milk necessarily consumed by a calf, which is fed from the cow, until old enough to subsist on solid food. In this section of the country, where butter and cheese are manufactured, each cow is estimated to make an annual return of from thirty to sixty dollars; where milk is sold directly from the farm, to consumers in our large cities, the return is much larger. It is only, therefore, in the remotest regions, that the plan of allowing calves to run with the cow for months can be practiced

with any profit, unless it be with breeders of pure blooded stock, commanding high prices in the market. In those sections where beef-raising and feeding are profitable, it is undoubtedly best to force the young animal to early maturity—as is done with the English Short-horns. And for the breeder of animals for this purpose, those which never falter in their growth, and arrive early at perfection, are the most desirable. Such animals as these may possibly remunerate the breeder for a somewhat liberal use of milk in feeding.

But in the rearing of dairy stock, or those classes of cattle which are not developed properly for feeding until two or three years old, some substitute for milk must be found. We shall endeavor to illustrate this by giving the cost, in figures, hereafter.

In the rearing of dairy stock, there are other things to be considered besides the cost and quantity of food, viz., the quality of the food and the mode of feeding, with reference to the

ANIMAL STRUCTURE.

It is comparatively an easy matter to breed animals, which, by their aptitude to fatten, will remunerate the feeder. The qualities belonging to an animal structure, designed for this purpose, are very perceptible, are easily transmitted, and are easily preserved and improved by feeding. Mr. Bakewell learned almost the precise mechanism adapted to his wants, as a producer of size and fat—the form and quality of bone, the shape of the parts containing the vital organs, and the organs of nutrition, that "feel," which an expert understands, so that he may almost be said to carry eyes in his fingers' ends, capable of exploring the internal organization of every animal. And this bone, and shape of body, and texture of the skin, are easily preserved and transmitted. Breeding does much, and feeding does more, towards this preservation and transmission. When Mr. Colling saw Hubback, he knew that his stomach, and glandular system, and nervous organization all tended towards the development of fat, and he believed it would be easy to transplant such lethargic faculties as these. He did this on good soil, and with proper care succeeded in making a creation of fat.

Mr. Aiton and his predecessors had a very different and a much more difficult task to perform. That delicate organization, which is called into operation when the food taken into the body is to be converted into milk, is much more difficult to comprehend or control. True, there is a certain physical conformation indicative of a large capacity for secreting milk: but when we remember that this capacity violates all law, and is as erratic as genius, we can comprehend how many difficulties they labored under, who, in Scotland, endeavored to establish a breed of milkers. They might secure the bony structure, the quality of skin, the shape of the muscle, the general outline, the form of udder most approved, and, after all this, there might be some deep defect in the powers of assimilating the food, in the glandular system, in the nervous organization, which entirely destroyed the utility of the animal. This accounts for the wide differences which exist in individuals belonging to every well-known and long-established breed of milkers, as the Ayrshires and Jerseys. Thousands of animals are driven from Short-horn and Devon regions, so nearly alike in weight and size and shape, that the law of their reproduction seems to be as fixed as that which gives to the casting the shape of the mould, be it repeated times innumerable. But no one can find a race of milkers, all brought up to a high standard, and all capable of transmitting that standard. We approach it, but are often vexed at the unexpected failures.

Now it would seem that the great rule to be observed in the rearing of dairy stock, is not to interfere with this delicate organization by the food furnished in early life. Why cannot the system of a heifer be injured by food, so as to disorganize her glandular functions, as well as the system of a cow, which can be forced into diseased action with the greatest ease; which, in fact, requires constant care, lest in her business of manufacturing milk she may take on disease? Why may we not, for instance, lay the foundation for garget, long before the udder contains a drop of milk? We do not feed a milch cow as we do a fatting cow, unless we are willing to run the risk of ruining her. For the wholesale statement so often made that what produces milk will also produce fat, and vice versa, is shown to be wholly unfounded by a comparison of the effect

of rowen hay, brewers' grains, shorts, and green food, with corn meal and oil cake.

A cow, moreover, never reaches perfection in her line until she has arrived at maturity; and she must reach this period of life with all her faculties unimpaired, if we expect her to be as good a cow as nature intended her to be. She differs in this respect from the best beef-growing animals, which are mature, as it were, from the start; and whose organizations, instead of being impaired for their business by generations of high early feeding, are, rather, more and more adapted to it.

We all know that the oldest and best families of Short-horns are not remarkable for constitutional elasticity and vigor. They have not great muscular strength, are not nervous and powerful in their action, and are deficient in the procreative faculties. Like the thorough-bred horse, which has also been forced to early maturity and early decay for many generations, they have become enervated and constitutionally delicate. High feeding has done this, in both instances; and as "a short life and a merry one," in the animal, is most profitable to the breeders of beef, and horses fit only for the turf, high feeding has accomplished what was desired—the gain being greater than the sacrifice.

Not so, however, with the cow. Her powers mature slowly, and depend very much upon the strength of her constitution. When this is impaired, either by breeding or by feeding, her value is diminished. For in the work of bearing young, and giving milk, in which her whole life is passed, the tax upon her vital forces is such that none but the most robust can endure it. In establishing a dairy breed, therefore, early maturity, with its accompanying evils, is not desirable. On the contrary, it should be avoided, and that mode of feeding should be adopted which will be conducive to health in the individual and in the breed, and which will in no way exhaust the powers or shorten the life of the race.

In addition to this, great regard should be had in raising dairy stock, to the effect which different kinds of food produce upon the animal economy. Whatever enlarges the bony structure of the female calf, beyond what is necessary for her strength, is worse than useless. A coarse-boned cow rarely reaches that standard of excellence, both in the quantity

and quality of her milk, which is attractive to the breeder, or satisfactory to the consumer.

So too of fat. The fat-cells, that tissue of the body in which adipose matter is deposited, are found in fat and lean animals alike—the difference consisting in the amount of their contents and their number only. For the supply of fat, certain organs are provided, which are capable of receiving all that excess of non-azotized compounds, such as starch, oil, &c., which is contained in the alimentary matter taken into the body. Where there is a ready absorption of these compounds into the vessels, fat is produced, especially if with this absorption there is combined a vigorous power to generate adipose tissue. Where they are not absorbed, accumulations of fat do not take place; and where they are absorbed, without being provided with adipose tissue, they would accumulate injuriously in the blood, if not drawn off by the liver. Hence it is that in warm climates, where there is diminished excretion through the lungs, and non-azotized food is not got rid of by the respiratory process, the liver is overworked, its function becomes disordered from its inability to separate from the blood all that it should draw off, and these injurious substances accumulating in the blood, "produce various symptoms that are known under the general term bilious." Hence, also, some persons never become fat, however large the quantity of oily matter taken into the stomach; and it is in such persons that the tendency to disorder of the liver from overwork is most readily manifested; they are, therefore, obliged to abstain from the use of fat-producing articles of food. It is the power, therefore, to absorb these fat-producing articles of food, and to generate adipose tissue for their reception, that saves the liver from being overtasked, and results in accumulations of fat. The constituents of fat are termed stearine, marzerine, and oleine.

We have dwelt upon the production of animal fat, and the organs engaged in its manufacture, in order to show how distinct a part of the animal economy it is, and how naturally the fat-producing functions can be transmitted, independently of all others, and may be cultivated at the expense of all others.

The secretion of milk is a very different matter, and is performed by certain glands, whose business it is rather "to

elaborate from the blood certain products, which are destined for special uses in the economy, than to eliminate matters whose retention in the circulating current would be injurious." These glands, called mammary glands, perform as is supposed the chief part of the work of elaborating the elements of milk; although it is not yet ascertained how much of this elaboration takes place in the blood during its circulation. Be this as it may, the production of milk is a very different business from the production of fat, and does not result in the combination of the same elements, as are contained in the adipose tissue and fat-cells.

It is well known, moreover, that the proportion of two, at least, of the principal ingredients of milk, is liable to great variation with the circumstances of the animal. Dr. Playfair has ascertained "that the proportion of butter depends in part upon the quantity of oily matter in the food; and in part upon the amount of exercise which the animal takes, and the warmth of atmosphere in which it is kept. Exercise and cold, by increasing the respiration, eliminate part of the oily matter in the form of carbonic acid and water; while rest and warmth, by diminishing this drain, favor its passage into the milk. The proportion of casein, on the other hand, is increased by exercise; which would seem to show that this ingredient is derived from the disintegration of muscular tissue." The experience of every farmer teaches him that an animal which has a large, heavy, muscular development, and is thus furnished with the means of rapid locomotion, is seldom a good milker. Her digestive apparatus is more devoted to her fleshy fibre than to the preparation of milk. The same may be said of fat and bone. So true is this, that among cattle bred expressly for the stall, the females often furnish hardly milk enough to sustain their own offspring; and in countries where the bone and muscle of the cow are developed by labor, her service in the dairy amounts to but little.

It would seem, therefore, that in rearing animals for the dairy, care should be taken that the young are not so fed as to develop a tendency to great size, either in frame or in adipose tissue; nor so as to establish in the end a race which has every faculty except that of producing milk. We have all seen how high-feeding of the young has in a few generations,

and sometimes in one or two, removed from a family of vigorous, nervous, muscular and active horses, all traces of those characteristics which have given them value. What they had acquired on the homely fare of their native hills, they lost when brought and bred into greater prosperity. The hard and wiry tendon vanished; the elastic and well-defined muscle was rounded off into graceful effeminacy; the carcase and adipose tissue had gained the ascendency, through the aid of good living, and a luxurious life from youth upward. Some of us have seen a promising heifer calf, the offspring of a good milker, pampered in its youth, and fed until it became anything but the dairy animal which its ancestry promised.

We would not advocate a deficiency of food for young dairy stock; but we would argue against an excess of articles of a highly stimulating quality. The plan of the Ayrshire farmers is undoubtedly a good one—to take their calves early from the dams, feed them from the dish, and bring them to solid food or pasture as soon as the condition of the young stomach will allow. Instead of linseed meal, they use a great quantity of oatmeal—an article of food much less predisposing to fat, and keeping up a vigorous growth. We have in New England the best quality of English hay as a basis of feeding; and after the calf is weaned, or after he has had milk enough to give him a fair introduction into life, hay, in the form of hay-tea, and afterwards of rowen, is undoubtedly the best food the animal can have, especially when aided by a few roots, such as turnips or carrots. In some cases milk is abandoned at a very early age, and skimmed milk is advantageously used as a substitute. We would not recommend the use of grain, especially that containing a superabundance of oily matter, as Indian corn or linseed, for young dairy stock. Perhaps corn-meal sparingly, or barley or oatmeal, may be used in winter, should the animal seem not to thrive well. But a calf that is properly weaned and fed after weaning, and furnished with a good pasture, will be carried through the first winter most satisfactorily on good sweet hay, especially rowen, with roots. In this way can a uniform and well-balanced animal be produced, which, when put to dairy service, will not become coarse and raw-boned in her appearance, nor take on flesh at the expense of the milk-pail.

COST AND QUANTITY OF FOOD.

Of the cost and quantity of food required to carry a calf through the first year of its existence, it is very difficult to make an estimate. There are certain modes of feeding however, the cost of which is easily computed. Take, for instance, the plan adopted by some, as referred to above, of allowing the calf to run with the dam, until it is six months old. Suppose the cow to give the calf eight quarts of milk per day, at the following prices:—

8 quarts at 2 cents per quart for 6 months, . .	$26 88
8 " 3 " " " 6 " . .	40 32
8 " 4 " " " 6 " . .	53 76

One or another of these prices milk will command, almost any where, whether sold, or converted into butter and cheese.

Take, now, the first estimate, and add to it the cost of keeping during the winter, the articles being estimated in proportion to the price of the milk, and we have—

Amount of milk consumed, ...	$26 88
Hay, during first winter, ...	5 00
Roots, during first winter, ½ peck per day for 4 months, at 17 cents per bushel, ...	3 16
Cost, at one year old, ...	$35 04

From one farmer celebrated for his stock, we have the following mode, with our own estimates,

50 quarts of milk at 2 cents per quart, . . .	$1 00
700 quarts of skimmed milk at 1 cent per quart, .	7 00
Pasture, for 5 months, ...	2 00
Hay, during first winter, ...	5 00
Roots, during first winter, ½ peck per day for 4 months, at 17 cents per bushel, ...	3 16
Cost, at one year old, ...	$18 16

It is well known to cattle breeders that the feeding of the first year is the most expensive and requires the most care. A calf, dropped early in the spring, has consumed nearly as

much in value, when it has arrived at the commencement of its second year's pasturing, as it will during the two following years, or until it is three years old.

Taking the last mentioned animal whose cost at one year old, was	$18 16
Add second year's pasturage, ...	3 00
second year's wintering, ...	8 00
third year's pasturage, ...	5 00
third year's wintering, ...	10 00
Cost of rearing to three years of age, . .	$44 16

It is not claimed that these figures represent in all cases the precise cost of rearing an animal. The variations in the price of food in different localities, the different modes of feeding necessary for the various classes of animals raised, and the kinds of food used, all modify to a considerable extent the expense involved in the business of feeding. We have given what seems to be an average of the cost; and it is for those who furnish good animals for the dairy, for the butcher, for the stall, or for work, to judge of the profits to be made, after considering the value of the manure, and the fact that on every farm there is almost always a certain quantity of unmarketable produce, which serves very well as food for young cattle and stores. Neither should we forget that the conversion of farm produce into beef or dairy products, is, in remote sections, where transportation is difficult, the most convenient and profitable mode of disposing of it.

QUANTITY OF FOOD.

Of the quantity of food required for feeding animals, it is equally difficult to judge, with any satisfactory precision. No two farmers feed precisely alike; and no two writers agree exactly in their estimate of the amount of food required by cattle. We are told by one that ten pounds of English hay, half a bushel of roots, and two quarts of corn-meal, or oil-cake or cotton-seed, is sufficient food for a milch cow per day, during the winter. Another claims to have fed satisfactorily on eight pounds of hay, with a bushel of roots, and two quarts of meal, or four of shorts. Another estimates fifteen pounds of hay, with half a bushel of roots, or two quarts of meal, as the most

economical mode of feeding. Calculations have been made of the ratio between the weight of the animal and the amount of food required, which, although having the appearance of accuracy, must be modified by circumstances connected with the condition of the animal, and the care which it receives. It is acknowledged, that warmth, quiet, and comfort are essential to economical feeding; and we should not lose sight, therefore, in making our calculations, of the skill of the feeder, the temperature of the climate, and the protection afforded the animal. There is one rule, which, every judicious, observing and intelligent farmer can observe with safety; and that is, to feed enough of whatever is given, to keep cattle in thriving condition, taking care to keep them warm, clean, free from vermin, and giving them their food regularly and in fixed quantities.

Of the more artificial modes of feeding, it may be proper to make some comparative estimates; we refer especially to *soiling* and *steaming*.

SOILING.

We submit the following estimate of the comparative expense of soiling and pasturing twenty cows, from June 1st to November 15th—five and one-half months.

In making this estimate, we have taken seventeen acres of land—the amount specified for this purpose by the advocates of soiling. We have considered, that land, in condition to support these cattle, would yield two tons of hay to the acre. We have estimated the price of pasture land at the average rates for *good* land of this description, and have allowed four acres of this land for the support of each cow. We have endeavored to take the usual expense of a man per month, including his board; and have allowed for the manure, all that is claimed for it. We consider that a *good* pasture will support cattle properly; and have omitted all comparisons of the health of animals confined and at large in the summer season, and of the quality of the milk yielded under the different circumstances. We have estimated the cost of pasturing rather above the average, and have charged no expense of litter, &c., against soiling.

Land required for soiling 20 cows from June 1st to November 15th, 5½ months, 17 acres.

Value of hay grown on land, 34 tons, at $10 per ton, standing,		$340 00
Labor of feeding, &c., one man, at $20 per month,		110 00
Aggregate expenses of soiling,		$450 00
Cr. By manure, as estimated,		200 00
Net expenses of soiling,		$250 00

Pasture, 80 acres at $30 per acre, $2,400.		
Interest on cost of pasture,	$144 00	
Repairs, annual, on fences, &c.,	10 00	
Expense of pasturing,		$154 00
Balance due on account of soiling over pasturing,		$96 00

We do not take into account the loss of 17 acres of land for the supply of winter forage, or crops, nor the expense of converting the droppings of the cows into two hundred dollars' worth of manure; neither do we calculate the expense of cultivating 17 acres of land.

STEAMING.

Of preparing food by steam, much has been said and written; and many experiments have been made. It seems to be generally conceded, that for the feeding of cattle, roots, such as mangolds, swedes, and carrots, are reduced in weight and in nutritive power by steaming. The question, therefore, with regard to this process of preparing food, seems to be whether coarse and cheap fodder, usually unsalable in large quantities, and fed to waste, can be raised to the value of good English hay as an article of food; and perhaps whether English hay can be more economically fed, by steaming than without it. In making a calculation on this, we propose to take hay at twelve dollars per ton, and to allow each animal in a herd of twenty, twenty-five pounds per day, a quantity sufficient for a medium sized cow, without the addition of grain or roots. We say nothing of the expense of cutting the fodder that is steamed, because it can be done, by a little additional use of the labor of men and horses on the farm. We do not estimate the interest on the cost of steaming apparatus, nor the wear and tear.

Twenty-five pounds of hay to each of 20 cows, per day, = 500 pounds.

Ton of hay consumed in 4 days at $12 per ton, = $3 per day.

Cost of keeping each cow on hay, (20 at $3 per day,) = 15 cents per day.

Ten pounds of corn-fodder to each of 20 cows per day, = 200 pounds.

Ton of corn-fodder consumed in 10 days, at $4 per ton, = 40 cents per day.

Meal, 2 quarts each, 40 quarts at 2 cents per quart, = 80 cents per day.

Cost of fuel, (steaming every other day,) 8 cents each time, 4 cents per day, = 40 cents.

Amount of expense per day, on the ton of corn-fodder = $1.60.

Cost of keeping each cow, (20 at $1.60 per day,) = 8 cents.*

In addition to this estimate, in favor of steaming the coarser kinds of food for cattle, we should take into consideration the undoubted fact that cattle are kept in better condition on the proposed kind and amount of steamed food, than they are on the proposed amount of English hay. For milch cows, the former is undoubtedly preferable. And no one can doubt the economy of converting the hard and coarse stalks of corn, which are too apt to be entirely wasted, or to encumber the manure heap, into a nutritious and palatable food. The same may be said of straw and coarser hay. We do not propose to describe the mode of steaming, and the apparatus by which it is done—this knowledge is easily obtained by all who would try the experiment. But we are satisfied, from experience, and from the testimony of some of our best practical farmers, that steaming is worthy of careful consideration. In estimating the cost of steaming corn-fodder and coarse straw and hay, we have added the expense of meal, because it is essential to the process.

* In making these estimates we have been governed by what seemed to be a fair average price of the various articles of food consumed throughout the State. We have estimated a ton of corn-fodder as worth, before cutting and cooking, one-third of our estimated price of hay. Some farmers think it is worth one-half as much as hay. So of meal—we have estimated it at 64 cents per bushel. Wherever the prices are different from these, it will be easy to make calculations accordingly, and thus establish the ratio.

We are not sure that there is any economy in steaming English hay—beyond that which is always gained by cutting the hay fine and mixing meal with it, where it is desirable to feed meal. We are not prepared to say, that the additional expense of steaming is compensated by the increased nutritive quality of the hay, or by the diminution of the amount consumed. We cannot ascertain that experiments have been made, sufficient to determine this point.

There seems to be no doubt that steaming not only renders the food more easily masticated, and thus provides against that increased effort, which the best feeders have found to be an obstacle in the way of fattening cattle on long and dry feed, but it also develops certain nutritive qualities. Mr. Horsfall, for instance, found that "bean-straw, uncooked, is dry and unpalatable; by the process of steaming it becomes soft and pulpy, emits an agreeable odor, and imparts flavor and relish to the mess." And he found also that when brought to a state which was attractive to cattle, they obtained from it certain valuable elements, such as albuminous matter, to a much larger degree than they did from hay. "Bran also undergoes a great improvement in its flavor by steaming, and it is probably improved in its convertibility as food; it contains about 14 per cent. of albumen, and is peculiarly rich in phosphoric acid, nearly 3 per cent. of its whole substance being of this material." The flavor and value of rape-cake was also much improved by steaming, and we have no doubt that the effect produced upon bean-straw, bran and rape-cake, is also produced upon corn-fodder, corn-meal, and oat and barley-straw.

Mr. Mechi, in his extremely interesting volume, in discussing the question of converting straw into manure, by treading it in the yards as is practiced in England, or by steaming and feeding, says:—

"The cost of preparing the straw for food, where steam is used, forms no impediment to its profitable use as food. A ton of straw may, by steam-power, be cut up into ¼ inch lengths for less than 3*s.* per ton; by hand-labor it would cost 6*s.* per ton. The steaming would cost very little; but even supposing the cost of boiling or steaming was 3*s.* per ton, still there would be a manifest advantage in feeding out, and there would be a saving in dung-heaps or carting, in comparison with the ordinary process. Mr. Horsfall says: 'In wheat-straw, for which I pay

35*s.* per ton, I obtain ½ lb. of oil, besides 32 lbs. of starch, or (the starch reduced as oil) 18½ lbs. for 1*s.* 2½*d.*, available for the production of fat, or for respiration. I know no other material from which I can derive, by purchase, an equal amount of this element of food at so low a price.' Mr. Horsfall can afford to give 35*s.* for a ton of wheat-straw, or 40*s.* for a ton of bean-straw, to use as food, with a good profit; but if he purchased it merely for the purpose of manure, it would not be worth to him more than 9*s.* 7*d.* per ton.

"For several years I steamed nearly all the straw for my animals, horses included, and was enabled to keep a very large number. Owing to a change of bailiff and alterations in my buildings, rendered necessary by my increased family, I partially reverted for a couple of years to the old system of straw for bedding; I soon found that I could not keep half as much stock, and the whole affair was far less satisfactory. The same remark applies to green food as straw; any cost of preparing and cutting up is far more than compensated by the advantageous conversion of the food by the animals which consume it. A very successful farmer of my acquaintance, who keeps more than 1,500 sheep, puts down his horse-power in the field, and cuts up all his green crops into about ⅛ inch length, mixing a little meal with it. I understood him to say that a man and boy, with the horse, will cut up enough for 300 sheep daily. In wet weather, or when the food is too succulent, he mixed a little straw with it."

But that the same benefit does not accrue to articles of food of a higher quality, or such as come nearer to the natural food of cattle, the following interesting experiment, reported in the Transactions of the Highland Agricultural Society, will prove.

Six heifers and four steers, the former two and the latter four years old, were selected on the 20th of February, 1833, and fed upon steamed and raw food, weighed, and an accurate account kept of their cost, expenses, and condition. For the purposes of the experiment they were divided into two lots—the heifers three in each lot, and the steers two.

"The heifers were allowed as many purple-topped Swedish turnips, topped, rooted, properly cleaned and cut into pieces, so that they could get them into their mouths, as they could consume, with 3 lbs. of bruised beans, and 20 lbs. of potatoes each beast per day, in addition to the turnips, with 7 lbs. of straw each.

"The steers were allowed as many of the same sort of turnips as they could eat, with 4½ lbs. of bruised beans, and 30 lbs. of potatoes each beast per day, with 7 lbs. of straw each. That is to say, the food of the

steers and heifers was the same, only with this difference: that the steers were allowed 1½ lbs. of beans and 10 lbs. of potatoes more per beast than the heifers, each day.

"One lot of the heifers and one of the steers was put upon steamed food, and the other lot of heifers and steers was put upon raw food.

"Both lots, the cattle on steamed as well as raw food, were fed three times a day—at daybreak, at noon, and lastly an hour before sunset.

"The bruised beans were given to the lots on raw food at noon, the potatoes one half in the morning, and the other half at noon.

"In both cases, the greatest attention was paid to give both those on raw and those on steamed food, as much as they could eat, but no more, so that their food might be as nearly as possible eaten up at the times of refeeding; this being, in the opinion of the reporter, always a prime consideration in every case of feeding, so that the stalls may always be kept clean, and regularly cleared of the refuse. * * *

"We very soon discovered that the cattle on the steamed food consumed considerably more turnips than those on the raw food, having laid down for the three heifers on raw food two cart-loads, containing together 25 cwt. 1 qr. 14 lbs. of turnips, and at the same time the like quantity for the three heifers on steamed food; but at the end of four days, very few turnips were left to put into the steam-tub, while apparently little more than the half of those laid down for the raw food were consumed. We then added another load of 12 cwt. 2 qrs. of turnips to the steam, and at the end of seven days the three heifers on the raw food had consumed the quantity laid down for them, while the three on steamed food had consumed the same quantity, and very nearly the whole of the additional quantity of 12½ cwt., at least all but about a half tub of 250 lbs. of raw turnips; and in order to be very correct, we proceeded to weigh the steamed turnips which were left unconsumed, when we found they only weighed 195 lbs. This circumstance of the weight being much less than we expected, put us on making a series of experiments, of the difference of the weight when put in raw and after being steamed, the result of which will afterwards be detailed; and also in ascertaining, by a more lengthened experiment, the relative quantities of food consumed by each lot of cattle.

"On this first and short experiment during one week of seven days, the three heifers on raw food had consumed, as before stated, 25 cwt. 1 qr. 14 lbs. of Swedish turnips, 3 cwt. 3 qrs. of potatoes, and 63 lbs. of bruised beans, being at the rate of 135 lbs. of turnips, 20 lbs. of potatoes, and 3 lbs. of bruised beans for each beast per day. While the three heifers on steamed food had consumed in the same space of seven days about 37 cwt. 16 lbs. of turnips, being at the rate of 190 lbs. of turnips, 20 lbs. of potatoes, and 3 lbs. of bruised beans per day for each beast, a

difference of 55 lbs. of turnips consumed by each beast on steamed food per day, more than what was consumed by those on raw food.

"On a pretty lengthened experiment, made on the difference of the weight of turnips before and after being steamed, we found the result to be as follows:—Upon turnips which had been taken from the ground in the early part of February, when they were full of juice, weighed when raw 5 tons 8 cwt.; after being steamed, 4 tons 4 cwt. 3 qrs. 16 lbs., being a loss of weight in the process of steaming of 1 ton 3 cwt. 12 lbs., or, in round numbers, the turnips may be said to have lost nearly $\frac{1}{5}$ of their weight in the process of steaming; and further, we may mention, that they also lost about $\frac{1}{4}$ or $\frac{1}{5}$ of their bulk. But at an after period, when the turnips were lifted from the ground after the middle of April, the loss of weight in the steaming process was not near so great, not being $\frac{1}{6}$ of their raw weight, in place of $\frac{1}{5}$, as formerly stated. The loss of weight on steaming potatoes was a mere nothing, not being more than $\frac{1}{30}$ part. Still, although the cattle at the latter period, viz., the end of April and beginning of May, did not consume quite so much weight of turnips, they consumed fully more bulk. The turnips having lost considerably in weight in proportion to their former bulk, it now requiring a larger cart-load to weigh 16 cwt. than it did in the month of February; this circumstance being easily accounted for, because the tops of the turnips were now vegetating rapidly, and the bulb losing its former sap. But in every case throughout the whole course of the experiment, the difference consumed by the cattle on steamed food above those on raw, was about 55 lbs. of turnips per day for each beast.

"As formerly stated, the steers were allowed, in addition to the turnips, 30 lbs. of potatoes each, and 4½ lbs. of bruised beans, being 10 lbs. of potatoes, and 1½ lbs. of beans each beast more than the heifers per day. In this case, the result was exactly similar to that of the heifers, the steers on the steamed food consuming about 55 lbs. per day of turnips more than those on raw food each beast.

"The steamed food being 94 cwt. 14 lbs. of turnips for twenty-eight days of two cattle, about 195 lbs. per day, and the raw food being 70 cwt. for the same time, about 140 lbs. per day. The twenty-eight days alluded to were the last twenty-eight days of the experiment, from the 22d of April till the 20th of May. * * *

"In our calculations of the value of the keep, we have not stated any thing for straw consumed by the cattle, as they were frequently supplied with litter of the same sort of straw, not deeming the straw of any other use than being made into dung."

The following extracts from an annexed table are significant. The weight of these cattle is given as follows:—

Live weight of 3 heifers fed on steamed food, Feb. 20,	3,108 lbs.
" " " " Mar. 20,	3,374 "
Increase of weight during first month,	266 "
Live weight of 3 heifers fed on steamed food, April 20,	3,591 "
Increase of weight during second month,	217 "
Increase of weight during third month,	196 "
Total increase for three months on steamed food,	679 "

Live weight of 3 heifers fed on raw food, Feb. 20,	3,115 "
" " " " March 20,	3,374 "
Increase of weight during first month,	259 "
Live weight of 3 heifers fed on raw food, April 20,	3,598 "
Increase of weight during second month,	224 "
Increase of weight during third month,	154 "
Total increase for three months,	637 "

The account kept of the steers shows the same relative figures. We quote further the estimates with regard to the heifers, as sufficient to illustrate the views set forth:—

Cost of Keep of Heifers for One Week.

Three heifers on steamed food—		
Consumed of Swedish turnips, 37 cwt., 16 lbs., at 7 cts. per cwt.,		$2 76
Consumed of potatoes, 3 cwt., 3 qrs., at 28 cts. per cwt.,		1 04
" " beans, 1 bushel, 2 qrs., 7 lbs.,		67
" " salt,		02
Estimate for coal and extra labor,		44
Cost of one week of three heifers,		$4 93
Three heifers on raw food—		
Consumed of Swedish turnips, 25 cwt., 1 qr., 14 lbs., at 7 cts. per cwt.,	$1 89	
Consumed of potatoes, 3 qrs., 3 lbs., at 28 cts. per cwt.,	1 04	
Consumed of beans, 1 bushel, 2 qrs. 7 lbs.,	67	
" " salt,	02	
Cost of one week of 3 heifers on raw food,		$3 62
Additional cost per week on 3 heifers on steamed food,		$1 31

Cost of Keep of Three Heifers for One Week.

Cost of 3 heifers on steamed food from the 20th of February till the 20th of May, 12 weeks, 5 days, at $4.93 per week,	$62 66
Cost of 3 heifers on raw food from the 20th of February till the 20th of May, 12 weeks, 5 days, at $3.62 per week,	47 99
Total additional cost of 3 heifers fed on steamed food, above those on raw food,	$14 67

Estimate of Profit and Loss.

Value of three heifers on steamed food, at 20th February—

Value of dead weight, sinking offal,	$155 05
Add cost of keep, as above,	62 50
Total cost,	$217 55
Value when killed,	219 55
Profit on heifers on steam food,	$2 00

Value of three heifers on raw food at 20th February—

Value of dead weight, sinking offal,	$155 39
Add cost of keep, as above,	45 77
Total cost,	$201 16
Value when killed,	216 96
Profit on cattle on raw food,	$15 80

The estimates on the feeding of the steers arrive at similar results; the loss on one steer fed on steamed food being 82 cts.; while the profit on one steer fed on raw food was $2.41. These two steers were turned to grass the following summer, and both increased equally in weight, no difference in their thrift at grass, having been produced by the two modes of winter feeding.

Every American farmer will be struck in reading the above experiment with the fact that no hay at all was used in the feeding, and so little straw, and of so poor a quality, as not to be taken into the account. This is very much the case in a large proportion of cattle feeding in Great Britain. Mr. Hors-

fall says: "My food for milch cows, after having undergone various modifications, has for two seasons consisted of rape-cake 5 pounds, and bran 2 pounds, for each cow, mixed with a sufficient quantity of bean-straw, oat-straw, and shells of oats, in equal proportions, to supply them three times a day with as much as they will eat." The hay crop, in English cattle husbandry, does not, as here, lie at the foundation of feeding. There is no doubt that this valuable fodder is more important to us during our longer and colder winter, than it is in their milder climate. Grass, moreover, is a crop better adapted to our mode of farming, extended as it is over a large surface, and not carried on with the skill of what is called high agriculture.

With us, therefore, excepting in the neighborhood of good markets, hay forms the basis of our feeding; and it is but reasonable that our estimates of feeding should be made in comparison with the use of hay. And it is important for the New England farmer to know whether, at a distance from market, he can find a better use for his hay than to convert it into cattle of various descriptions.

AMOUNT OF FOOD FURNISHED BY VARIOUS CROPS.

Without entering into any accurate calculation of the cost of keeping cattle on different kinds of food, we propose to make a short comparison of the amount of food furnished by the various crops used for feeding, from a given piece of ground.

Taking two tons of hay per acre as the basis of calculation, and as representing the kind of cultivation which is employed, we may concede that an acre of ground will yield the following crops: hay, two tons; Swedish turnips, eighteen tons; mangold wurzel, twenty tons; carrots, twenty-five tons; Indian corn, seventy bushels.

According to the best experiments, the nutritive equivalent of hay being represented by 100:—100 pounds of hay are equivalent to 676 pounds of Swedish turnips, 382 pounds of carrots, and 70 pounds of Indian corn.

The practical values, as obtained by experiments in feeding, are:—hay, 100 pounds is equivalent to 300 pounds of Swedish turnips, 400 pounds of mangold wurzel, 250 pounds of carrots, and 52 pounds of Indian corn.

Dividing the number of pounds of each of these crops on an acre, according to estimates above, by the number of pounds representing the practical value of each for food, and we have as results, figures which will express the comparative yield of each acre, according to the crop occupying it. For instance:—

Hay, per acre,	4,000 lbs. ÷ 100 =	40
Swedish turnips, per acre,	36,000 lbs. ÷ 300 =	120
Mangold wurzel, "	40,000 lbs. ÷ 400 =	100
Carrots, "	50,000 lbs. ÷ 250 =	200
Corn, "	4,550 lbs. ÷ 52 =	87½

According to this table, an acre will yield three times as much food in turnips as in hay; two and one-half times as much food in mangolds, as in hay; five times as much in carrots as in hay; and about two and one-fifth times as much in corn as in hay.

Now in order to arrive at the cost of feeding the above articles to cattle, and at the comparative value of each as an article of food, we must be able to ascertain the prices which they bear in different localities, the advantages of the market, the cost of labor, and the kind and value of the cattle which are fed. We have furnished the figures, for the benefit of those who desire to ascertain, if possible, the most economical and useful crops for cattle husbandry. There is no doubt that, valuable as hay is, as an article of food, and universal as is its use here, there are crops which form an useful ally to it, in the business of carrying cattle through the winter. The question is, which of these crops is the best for such a purpose—the most economical and profitable? There are sections of the State where the corn crop will not ripen, and where the cultivation of roots would do much toward enabling the farmer to support all the cattle in winter, which his pastures will bear in summer, a state of things which does not now exist. In some regions the hay crop is large, hay is cheap, and labor scarce. The farmer there must judge for himself, how far it will pay to devote himself to any other than the hay crop. Circumstances vary as localities vary, and it is they alone which can guide the intelligent farmer in the management of his land for his cattle, and can enable him to judge of the cost of feeding them, as well as to decide upon the breed best adapted to his purposes.

SELECTION OF BREEDS.

Man is governed by this law in his agricultural operations, all the world over. Instinct teaches him, long before experience has led him through her many paths, that he must be obedient to Nature in that business which depends for its prosperity upon her smiles; to Nature upon whom he leans for support, at the same time that he endeavors to direct her course for his own benefit. The boasted agricultural wealth of England, with all its enterprise, ignores the favorite crop of America, because the skies of that island so command. The vegetable growth of tropical latitudes allows no intruder to take its place—and sugar, and coffee, and rice, and cotton, have their place on the earth, while they resign to their appropriate spheres the grass, and grain, and root crops of the north. The farmer of the north of Scotland is compelled to satisfy himself with the small and hardy cattle which his lands can feed, and has learned neither to envy nor imitate his neighbor of the southern counties, whose Short-horns revel in the luxury of a fertile region, the agriculture of which they represent. In Massachusetts, every locality has its own capacity, its own natural laws, its own adaptation to certain crops, and certain breeds of cattle. And here, as elsewhere, any attempt to violate these natural laws is sure to be compelled to pay the penalty. While the West has found in the improved Short-horn, a source of revenue which has, together with its grain crops, furnished the foundation of its agriculture, while the mild climate and verdant pastures of Kentucky have developed a race of cattle at last almost indigenous, and have raised them to such a degree of excellence, that the most careless observer knows that other breeds have no proper place there, the various sections of New England also designate the kind of cattle they can produce; so that the lesson may be easily learned.

In selecting that breed of cattle adapted to each locality, we must understand the agricultural capacity of that locality. We know very well that while the Durhams of Mr. Gore did not succeed in eastern Massachusetts, they laid the foundation of a most valuable stock in the centre of the State, and, together with the importation of Mr. Williams, have made the farmer's cattle of the Connecticut River, equal to the choicest specimens of the amateur breeder. We have been unable thus far to establish an uniform breed throughout the State, and it is

probable that we shall fail to do so, until there is more uniformity in the condition of our farms, and in the quality of our soil.

There is an animal which serves very well the general purposes of our farms. We mean that cow of medium size and good quality, and that ox whose vigorous step carries his weight, not too great, over our hills, and which thrives upon the short grass of our pastures, and in our somewhat too economical stalls. Not as the result of one line of breeding, but as the fruit of a mixture of many, does this animal claim to be *native*. Whatever breed we select, this animal is the stock upon which we are to engraft an improvement.

Wherever the breeder possesses the materials for preparing his cattle for market, he undoubtedly requires a breed of rapid growth and easy fattening capacity. Where he is breeder and feeder both, early maturity is a great desideratum, even if in order to obtain that, he is obliged to rear an animal which cannot recuperate from the effects of neglect in its youth. Where, however, the feed is scanty, and the farmer cannot afford to support an animal on high feed, during the most unprofitable portion of its life, slower development, and a more hardy breed is required. Where the dairy is the object, as it is in a large portion of Massachusetts, a strong and vigorous animal, not so large as to starve upon a dry pasture in August, nor so small as to be useless when her dairy career is ended, is desirable; for the dairy farmer cannot make money on either. The former consumes all its profit during life, and the latter sinks too much capital at its death.

For the first of these purposes, there is but little doubt that Short-horns can be profitably engrafted on our native stock. Experience proves this. For the second, the Hereford or the Devon has been possibly used to some advantage. For the third, the Ayrshire possesses the most admirable qualities, and undoubtedly stands at the head. This we say without intending to disparage other breeds, which evidently have merit in their proper places. We recognize the fact that it is the improvement of the cattle which we already possess, and not the expensive business of importing pure bred animals, that interests our farmer. We have never yet seen a Short-horn cross that

was not an improvement on the dam, so far as early maturity, size, or thrift are concerned; we are well aware that Devons and Herefords have laid the foundation of some of our best families of working oxen; and an Ayrshire bull has thus far always benefited the dairy of the region into which he has been introduced. Many breeds have had no chance here; but of those, other than the already mentioned, which have been tried, the Jerseys, although admirable animals in themselves for the production of butter, and although the crosses are now and then excellent, still lack that substance which a New England farmer needs, and have not yet become any thing more than the choice and valuable animal of the gentleman's stable; the Kerries are not yet largely introduced; and the early importations of Dutch cattle have produced no results, that we are aware of, satisfactory to the intelligent farmer and breeder.

COMPARISON OF BREEDS.

As a description or history of the breeds which we have selected is wholly unnecessary, so well are they now known, and so often have they been delineated, we shall simply, in a brief manner, present a comparative view of their merits.

It seems to be generally conceded, that either accidentally or designedly, certain qualities have been combined in the improved Short-horn breed, which enable them not only to take a high stand of themselves, but to improve the stock of almost every region into which they are introduced. In earlier times, when the foundation of the the Short-horn, the Durham or Yorkshire blood was brought into this country, very considerable benefit arose from it to the dairy stock of the United States. This can be satisfactorily proved, by selections of cows from those sections into which this blood was introduced. The dairies of Worcester, Hampden, and the Kennebec Valley, all bear witness to the original value of this blood, as an admixture for the so called native stock of those sections. That there was a valuable strain in this old race is not only manifested by the fact now mentioned, and by the fact, moreover, that they are the origin of the modern breed of Short-horns, but also by many evidences that the introduction of this blood into the inferior cattle of Scotland,

did much to establish the remarkable dairy stock of the Ayrshire country.*

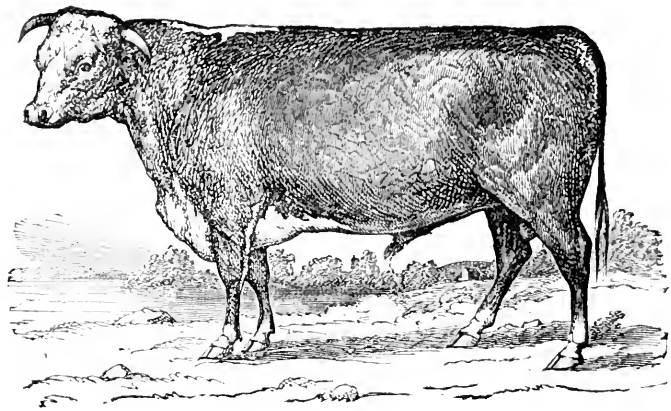
At the present time, this breed of cattle is valued chiefly for their beef-producing faculties, especially in England, where they are bred in the highest perfection, and among the most enterprising breeders in this country. There are among us some families still, for which in their purity, the dairy properties of the original breed are claimed—and in some instances justly. But neither our climate nor the usage to which the dairy stock of New England are subjected, such as short pastures in summer and coarse feed in winter, is favorable to the development of so large an animal. In some instances, where the blood has long been engrafted upon a native and hardier breed, it seems to have become acclimated, and "Durham cows," so called, are really valuable, when of suitable size. Grade Short-horn oxen too, when properly cared for, are valuable animals, unless descended from a race whose mammoth proportions find no "aid and comfort" on the short pastures too prevalent among us. They are then as coarse and ill-favored as possible. They require good feed and good farming, especially on their first introduction, and before they have become planted for generations on the soil. When well-fed, and well-crossed, and habituated, they are a valuable breed. It is an undoubted fact that the grades easily adapt themselves to the spot on which they are born, and that while the delicacy of the pure blood is removed, the size and thrift of the hardier race upon which it is graded, are much enhanced.

The only breeds with which the Short-horns can properly be compared are the Herefords and Devons. Herefords, on the

* Mr. Sanford Howard, in a valuable and interesting Prize Essay, written for the New York Agricultural Society, 1851, says: —

"The most reasonable conclusion from all that has been written in regard to the origin of the modern Ayrshires, taken in connection with the points and characters of the animals themselves, is that they were produced by a union of the blood of the Holstein or Teeswater Short-horns, and the Alderneys, with the ancient stock of the district from which they take their name." Mr. Howard is of opinion that the cross of the Ayrshire as thus produced, with the West Highland, the origin of the celebrated Swinley family, has still further improved the breed, in regard to useful properties, and has given it that hardiness and strength of constitution for which they are now remarkable.

question of size, and of profit to the feeder, have long been competitors of the Short-horns. They have been well bred in England, and are a much older breed than their rivals. On the score of strength, energy, hardiness of constitution, and quality

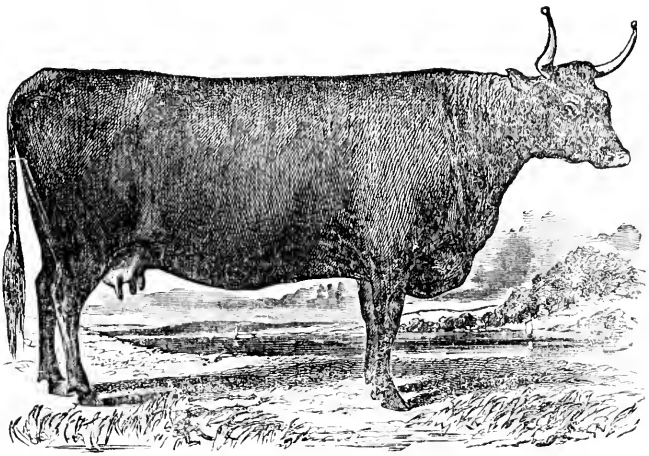


Hereford Bull.

of flesh, they contrast favorably with them; and while they are not so profitable to the breeder, they are often preferred by the feeder. Their deep bodies, broad hips, large frames, thick and mellow hides, and vigorous motions indicate great thrift and power. And in some instances they have shown a remarkable return to the feeder, after having performed a vast deal of valuable service to the farmer. Their claims, as dairy animals, in any period of their history, are small.

It cannot be denied that the introduction of Hereford blood into this country, has not been attended with very successful results. It may be that the animal, from the antiquity of his breed, has become, as it were, indigenous to certain portions of England; and like all ancient races does not bear transplanting, and is too decided for crossing. Be this as it may, Herefords have thus far failed to compete with Short-horns, both in Massachusetts and in other parts of this country, as far west as Iowa. Their natural preponderence of bone seems to be increased in the grades, and an ungainly frame is too often the result of breeding in this direction. There is no doubt that for the purposes of work, the pure-bred Hereford is more hardy and active than the Short-horn. But this does not appear to hold good with regard to the grades.

With regard to the Devons, they have reached a high standard in England, where for two centuries they have been bred and improved with great care. For aptitude to fatten, after reaching the age of three or four years, they are quite remarkable



Devon Cow.*

and the accounts given of their weight and shape, indicate great skill on the part of those engaged in their production. Their blood has evidently been largely infused into our New England stock, and must have been prominent among the earliest importations into this part of the country. With their size, shape, and quality, as represented among us, every farmer and butcher is acquainted; and he may be somewhat surprised to learn that in England they are fed to over two thousand pounds, and have competed successfully with some of the largest breeds, when brought to the stall. With us they have furnished that admirable animal known on the New England farm, as the "seven foot ox," red, straight, even, thrifty, hardy, quick, and vigorous, living well on short pastures, and, after having performed a vast amount of useful service, yielding on an average, a thousand pounds of beef, of the best quality. This is the animal which stands high among New England cattle, and which is evidently some form of Devon, bred and crossed here for many years,

* The illustrations for this article are taken from the Treatise on "Milch Cows and Dairy Farming," by Charles L. Flint, Secretary of the State Board of Agriculture.

until he has become indigenous—a native, so called. But this animal is becoming scarce; and wherever the introduction of modern Devon blood has been made, it does not seem to be attended with that success which its quality would promise. It is not often that a Devon bull of admirable proportions is found among us; and we do not hear of any sections into which they have been recently introduced with any very marked advantage. In our climate, and with our feed, they too often lose those proportions which render them so valuable when found in perfection. A certain deficiency in quarter, and in depth through the heart, and in good proportion along the chine and over the hips, has become too marked among them. And while we can point to herds of Devons of good proportions and size, well adapted to our farms, we still hear too much of the "little Devon bull," whose fine color and brilliant eye constitute attractions it is true, but not such attractions as appeal to the stall-feeder or the grazier.

Any comparison of dairy breeds is hardly called for here. The Ayrshire and the Jersey, the two breeds of dairy cattle which now claim the most attention, as standing in the front rank, are so differently constituted, and are intended for such different purposes, that they cannot be called, in any sense, rivals. For an animal expected to give a large yield of milk on a small amount of feed, of medium size, great strength of constitution, transmitting well its qualities whether pure or graded, furnishing a very fair proportion of butter, and a very large proportion of cheese, taking on fat well, and in the most valuable parts, the Ayrshires cannot be surpassed. But for the manufacture of butter of superior color and flavor, and for the conversion of the most nutritious food into the most condensed form of this table luxury, the Jersey is without a rival. It remains for the farmer, who has a knowledge of his own wants, to decide which of these breeds he will choose. And recognizing as we do, the great importance of the dairy to all New England farming, we urgently recommend the selection of such animals as will materially advance this interest.

S. L. Goodale, Esq., in his valuable treatise on the "Principles of Breeding," remarks truly, that—

"There is no branch of cattle husbandry which promises better returns than the breeding and rearing of milch cows. Here and there are to be found some good enough. In the vicinity of large towns and cities are

many which, having been culled from many miles around, on account of dairy properties, are considerably above the average; but taking the cows of the country together, they do not compare favorably with the oxen. Farmers generally take more pride in their oxen, and strive to have as good or better than any of their neighbors, while if a cow will give milk enough to rear a large steer calf, and a little besides, it is often deemed satisfactory."

In concluding this report, we would urge upon the farmers of Massachusetts, increased attention to the rearing and feeding of their cattle, as well as greater care in their selection. It is hardly necessary to repeat that this branch of husbandry is so important that it has employed the best agricultural skill for its development, and has enriched those who have pursued it with wisdom and judgment. The farmer has no aids and incentives to labor equal to his cattle—aids, as fellow-laborers and manufacturers of the best fertilizers for his lands—incentives, as indicating by their good condition that the farm which they are at all times ready to serve, is well managed. It is therefore of the highest importance that they should not only be properly fed and protected, but that they should be selected with care and judgment. It is none but good animals that pay for keeping—and they pay for good keeping—while poor animals do not pay for even poor keeping.

For the benefit of those who would stock their farms well, we quote the following rules, laid down in the "Complete Grazier," and containing many valuable suggestions, some of which, it is true, have been already referred to:—

"1. *Beauty, or Symmetry of Shape;* in which the form is so compact that every part of the animal bears an exact consistency, while the carcase should be deep and broad, and the less valuable parts, (such as the head, bones, &c.,) ought to be as small as possible. The carcase should be large, the bosom broad, and the chest deep; the ribs standing out from the spine, both to give strength of frame and constitution, and likewise to admit of ample room for the intestines; but yet not so much as to be what is called *high-ribbed*, as the butchers consider it an indication of deficiency in weight of meat. Further, the shoulders ought not only to be light of bone, and rounded off at the lower point, but also broad, and well covered with flesh. The back also ought to be wide and level throughout; the quarters long, the thighs tapering and narrow at the round bone, but well covered with flesh in the twist; and the flank full and

large. The legs ought to be straight below the knee and hock, and of moderate length, light-boned, clean from fleshiness, yet having joints and sinews of a moderate size, for the united purposes of strength and activity. In these points all intelligent breeders concur; but as beauty of shape too often depends on the caprice of fashion, it is more requisite to regard.

"2. *Utility of Form*, or that nice proportion of the parts which has already been noticed.

"3. The *Flesh*, or texture of the muscular parts; a quality which was formerly noticed only by butchers, but the knowledge of which is justly deemed essential by the enlightened breeders of the present day; and although this quality necessarily varies according to the age and size of the cattle, yet it may be greatly regulated by attention to the food employed for fattening them. As a knowledge of this requisition can only be acquired by practice, it is sufficient to state that the best sign of good flesh is that of being marbled, or having the fat and lean finely veined or intermixed, when the animals are killed; and, while alive, by a firm and mellow feel.

"4. In *Rearing Live Stock* of any description, it should be an invariable rule to breed from small-boned, straight-backed, healthy, clean, kindly-skinned, round-bodied, and barrel-shaped animals, with clean necks and throats, and little or no dewlap; carefully rejecting all those which may have heavy legs, roach backs, together with much appearance of offal. And, as some breeds have a tendency to generate great quantities or fat on certain parts of the body, while in others it is more mixed with the flesh of every part of the animal, this circumstance will claim the attention of the breeder, as he advances in business.

"5. In the *Purchasing of Cattle*, whether in a lean or fat state, the farmer should on no account buy beasts out of richer, or better grounds than those into which he intends to turn them; for, in this case, he must inevitably sustain a very material loss by the cattle not thriving, particularly if they be old. It will therefore be advisable to select them, either from stock feeding in the neighborhood, or from such breeds as are best adapted to the nature and situation of the soil.

"6. *Docility of Disposition*, without being deficient in spirit, is of equal amount: for, independently of the damage committed by cattle of wild temper on fences and fields, which inconvenience will thus be obviated, it is an indisputable fact *that tame beasts require less food to rear, support, and fatten them;* consequently every attention ought to be paid, early to accustom them to be docile and familiar.

"6. *Hardiness of Constitution*, particularly in bleak and exposed districts, is indeed a most important requisite; and in every case it is highly essential to the farmer's interest to have a breed that is liable neither to disease nor to any hereditary distemper. A dark color, and in

cattle which are kept out all winter, a rough and curled *pile* or coat of hair, are, in the popular estimation, certain indications of hardiness; but it must be obvious to every thinking person that this quality, though in some respects inherent in particular breeds, depends, in a great measure, upon the method in which cattle are treated. * * *

"8. Connected with hardiness of constitution, is *Early Maturity*, which, however, can only be attained by feeding beef cattle in such a manner as to keep them constantly in a growing state. By an observance of this principle, it has been found that beasts and sheep, when thus managed, thrive more in three years than they usually do in five when they have not sufficient food during the winter, by which, in the common mode of rearing, their growth is checked.

"9. A *Kindly Disposition* to take fat on the most valuable parts of the carcase, at an early age, and with but little food, when compared with the quantity and quality consumed by similar animals."

Guided by these rules, and governed by the wants of the farm to be stocked, the farmer may succeed in furnishing himself with an attractive and profitable breed of cattle—making such allowances in the selection of dairy stock as remarks previously made would indicate—and always remembering, that as to the good cultivator alone does the earth yield forth her increase in profitable measure, so to the careful and patient husbandman alone, will cattle, whether for the stall, the dairy, or for labor, yield a return in the full measure of their natural capacity, and with proper remuneration.

GEORGE B. LORING.
JOHN BROOKS.
MATTHEW SMITH.

Mr. R. S. FAY, from the committee appointed to consider the subject, presented the following

REPORT ON THE PROTECTION OF SHEEP, LAMBS, &c.

The committee to whom was referred "the subject, and to report what action is necessary to secure a fuller compliance with the law for the protection of sheep, lambs," &c., report:

That at the meeting of the Board of Agriculture, on the 9th day of January, A. D. 1861, it was voted "that the Secretary of the Board be directed to call the attention of the mayor and aldermen of cities, and the selectmen of the towns of this

Commonwealth, on or before the 20th of April, annually, to the law for the protection of sheep against dogs, (commonly known as the dog-law,) and to urge its enforcement; and that he be also directed to ascertain on the first day of October annually, from the cities and towns of the Commonwealth, the number of dogs licensed, and the amount received therefrom."

The adoption of this vote, and its communication to the town authorities, it was hoped, would be sufficient to secure the enforcement of the law, the justice and wisdom of which has not been questioned, so far as the committee have been able to discover, in any part of the Commonwealth.

The returns which have been received, do not, however, fulfil the natural and reasonable expectations of your committee. It appears that many of the towns have entirely neglected to enforce the law, while others have been so remiss in their duty as to render it almost inoperative. Few, very few, can return, as in Worthington and Upton, "*that every dog within the knowledge of the clerk of the town is licensed*," and from the small number generally given as licensed, it does not require this not unusual comment, "not one-third of the dogs licensed;" or "we do not observe any marked decrease in dogs, though few are licensed this year." That the law is culpably ignored in some cases, and in others, if not ignored, shamefully neglected, is very apparent, from the returns which have been received.

From twenty cities and towns, viz.: Chatham, Lanesborough, Windsor, Raynham, Groveland, Hamilton, Rockport, Buckland, Charlemont, Shutesbury, Sunderland, Blandford, Springfield, Enfield, Lincoln, Somerville, North Bridgewater, Wareham, Winthrop, and Mendon, no returns of dogs licensed have been received, and from thirty-four others acknowledgment is made that no tax or license for dogs has been collected. Many towns have returned but a single dog licensed, and forty have returned less than six in their respective towns. That the enforcement of the law has been neglected, if additional evidence were required, is shown by the fact that the number licensed in 1861 is little more than half the number licensed in 1859.* Although there is reason to

* By returns for 1859 there were licensed 32,707 dogs, paying $35,894. In 1861 there were licensed 16,905 dogs, paying $17,972.65.

believe that not more than half the dogs at that time paid the tax, and that the number in the Commonwealth has not much diminished.

Your committee do not believe that this open neglect of a law would exist if those who are called upon to execute it fully understood its provisions, and were aware of the penalties incurred by a neglect of its enforcement; otherwise such returns as the following would not have been made: "There was nothing received on account of license this year, because the town voted that those who had licensed previously should be allowed a free license this year, on account of surplus;" or returns like the following: "no notice taken of the law in this town the present year," and many others of a similar purport. Nor, were the law better understood, is it believed that the payment of the tax would have been left, as has evidently been the case in many towns, to the voluntary act of a few individuals. The sixty-sixth section, chapter 88, General Statutes, must have escaped the notice of the town authorities, otherwise this salutary law would not, like many others upon our statute books, have been made only to be broken. That section provides "that the mayor and aldermen of each city, and the selectmen of each town, shall require all dogs not licensed and collared according to the foregoing provisions, to be destroyed; and shall enforce all penalties herein provided. Any officer refusing or neglecting to perform the duties herein imposed upon him, shall be punished by fine not exceeding twenty-five dollars, to be paid into the city or town treasury." By the provisions of this Act, no city or town has any right to alter or repeal any portion of the law which requires that "every owner or keeper of a dog shall annually, on or before the thirtieth of April, cause it to be registered, numbered, described and licensed." The whole method of proceeding under this law is so plain and unmistakable in its intention and purpose, that it is almost inconceivable how any town officer should hesitate in carrying it out to the very letter. Believing it for the interest of the farmer, as it certainly is to the general tax-payer, that the provisions of the law be strictly observed, your committee would recommend that measures be taken to insure its observance, and, in case of future neglect, that the penalties for such cases provided be exacted. How this shall be done,

whether upon complaint only from parties who actually suffer loss by reason of such neglect, or by appointing some one under the authority of this Board to see that the law is enforced, and to take legal measures in all cases of neglect, it is premature perhaps to decide; the committee believing that a proper representation of the value and importance of its observation will fulfil the just expectations of the Board upon the subject.

The committee append hereto the returns to which reference has been made.

MARSHALL P. WILDER.
RICHARD S. FAY.
JAMES S. GRENNELL.

CITIES AND TOWNS.	No. of Dogs.	Tax paid.	CITIES AND TOWNS.	No. of Dogs.	Tax paid.
BARNSTABLE COUNTY.			BERKSHIRE—*Con.*		
Barnstable,	126	$130 00	Clarksburg,	1	$1 00
Brewster,	17	17 00	Dalton,	43	43 00
Chatham,*	–	–	Egremont,	48	58 00
Dennis,	1	1 00	Florida,	20	20 00
Eastham,	–	–	Great Barrington,	128	128 00
Falmouth,	1	1 00	Hancock,	3	3 00
Harwich,	1	1 00	Hinsdale,	–	–
Orleans,	–	–	Lanesborough,*	–	–
Provincetown,	2	2 00	Lee,	143	147 00
Sandwich,	75	75 00	Lenox,	80	84 00
Truro,	–	–	Monterey,	18	18 00
Wellfleet,	2	2 00	Mount Washington,	–	–
Yarmouth,	2	2 00	New Ashford,*	–	–
Totals,	227	$231 00	New Marlborough,	–	–
BERKSHIRE COUNTY.			Otis,	–	–
Adams,	87	$87 00	Peru,	16	20 00
Alford,	31	31 00	Pittsfield,	14	14 00
Becket,	66	66 00	Richmond,	18	18 00
Cheshire,	63	67 00	Sandisfield,	75	75 00

* No return.

CITIES AND TOWNS.	No. of Dogs.	Tax paid.
BERKSHIRE—*Con.*		
Savoy,	1	$1 00
Sheffield,	10	10 00
Stockbridge,	42	42 00
Tyringham,	18	18 00
Washington,	–	–
West Stockbridge,	59	59 00
Williamstown,	23	23 00
Windsor,	–	–
Totals,	1,007	$1,033 00
BRISTOL COUNTY.		
Attleborough,	282	$286 00
Berkley,	24	24 00
Dartmouth,	142	150 00
Dighton,	56	60 00
Easton,	98	110 00
Fairhaven,	62	62 00
Fall River,	30	30 00
Freetown,	25	–
Mansfield,	46	46 00
New Bedford,	265	273 00
Norton,	97	97 00
Pawtucket,	108	115 00
Raynham,*	–	–
Rehoboth,	117	129 00
Seekonk,	33	33 00
Somerset,	13	13 00
Swanzey,	70	70 00
Taunton,	341	341 00
Westport,	66	66 00
Totals,	1,875	$1,905 00

CITIES AND TOWNS.	No. of Dogs.	Tax paid.
DUKES COUNTY.		
Chilmark,	5	$5 00
Edgartown,	21	19 00
Tisbury,	11	11 00
Totals,	37	$35 00
ESSEX COUNTY.		
Amesbury,	16	$16 00
Andover,	91	95 00
Beverly,	19	23 00
Boxford,	46	50 00
Bradford,	21	21 00
Danvers,	100	116 00
Essex,	15	15 00
Georgetown,	11	11 00
Gloucester,	68	68 00
Groveland,*	–	–
Hamilton,*	–	–
Haverhill,	29	29 00
Ipswich,	69	73 00
Lawrence,	112	120 00
Lynn,	227	243 00
Lynnfield,	24	28 00
Manchester,	17	17 00
Marblehead,	34	34 00
Methuen,	89	97 00
Middleton,	48	48 00
Nahant,	–	–
Newbury,	4	4 00
Newburyport,	12	12 00
North Andover,	55	59 00
Rockport,*	–	–

* No return.

CITIES AND TOWNS.	No. of Dogs.	Tax paid.
ESSEX—*Con.*		
Rowley,	19	$19 00
Salem,	121	133 00
Salisbury,	13	13 00
Saugus,	85	85 00
South Danvers,	84	84 00
Swampscott,	–	–
Topsfield,	15	15 00
Wenham,	42	42 00
West Newbury,	63	63 00
Totals,	1,549	$1,653 00
FRANKLIN COUNTY.		
Ashfield,	21	$21 00
Bernardston,	29	29 00
Buckland,*	–	–
Charlemont,*	–	–
Colrain,	69	73 00
Conway,	9	9 00
Deerfield,	79	79 00
Erving,	–	–
Gill,	23	23 00
Greenfield,	105	108 00
Hawley,	–	–
Heath,	23	23 00
Leverett,	–	–
Leyden,	–	–
Monroe,	6	6 00
Montague,	66	70 00
New Salem,	4	4 00
Northfield,	42	50 00
Orange,	–	–
FRANKLIN—*Con.*		
Rowe,	10	$10 00
Shelburne,	49	53 00
Shutesbury,*	–	–
Sunderland,*	–	–
Warwick,	33	33 00
Wendell,	–	–
Whately,	2	2 00
Totals,	570	$593 00
HAMPDEN COUNTY.		
Agawam,	3	$3 00
Blandford,*	–	–
Brimfield,	55	55 00
Chester,	52	52 00
Chicopee,	117	125 00
Granville,	37	37 00
Holland,	8	8 00
Holyoke,	95	103 00
Longmeadow,	29	29 00
Ludlow,	1	1 00
Monson,	90	90 00
Montgomery,	–	–
Palmer,	10	10 00
Russell,	25	25 00
Southwick,	25	29 00
Springfield,*	–	–
Tolland,	28	26 20
Wales,	9	9 00
Westfield,	8	8 00
West Springfield,	46	46 00
Wilbraham,	96	100 00
Totals,	734	$756 20

* No return.

CITIES AND TOWNS.	No. of Dogs.	Tax paid.
HAMPSHIRE COUNTY.		
Amherst,	78	$78 00
Belchertown,	5	5 00
Chesterfield,	–	–
Cummington,	–	–
Easthampton,	–	–
Enfield,*	–	–
Goshen,	3	30
Granby,	26	26 00
Greenwich,	–	–
Hadley,	49	53 00
Hatfield,	3	3 00
Huntington,	–	–
Middlefield,	18	18 00
Northampton,	20	20 00
Pelham,*	–	–
Plainfield,	2	2 00
Prescott,	–	–
South Hadley,	81	97 00
Southampton,*	–	–
Ware,*	–	–
Westhampton,	1	1 00
Williamsburg,	1	1 00
Worthington,	47	51 00
Totals,	334	$355 30
MIDDLESEX COUNTY.		
Acton,	3	$3 00
Ashby,	1	1 00
Ashland,	55	59 00
Bedford,	2	2 00
Billerica,	4	4 00

CITIES AND TOWNS.	No. of Dogs.	Tax paid.
MIDDLESEX—*Con.*		
Boxborough,	5	$5 00
Brighton,	219	279 00
Burlington,	31	30 00
Cambridge,	378	410 00
Carlisle,	–	–
Charlestown,	63	63 00
Chelmsford,	4	4 00
Concord,	14	14 00
Dracut,*	–	–
Dunstable,	–	–
Framingham,	149	169 00
Groton,	68	68 00
Holliston,	93	93 00
Hopkinton,*	–	–
Lexington,	3	3 00
Lincoln,*	–	–
Littleton,	39	43 00
Lowell,	214	218 00
Malden,	116	120 00
Marlborough,	167	179 00
Medford,	128	144 00
Melrose,	22	22 00
Natick,	30	30 00
Newton,	24	24 00
North Reading,	55	59 00
Pepperell,	–	–
Reading,	87	103 00
Sherborn,	64	64 00
Shirley,	35	35 00
Somerville,	–	–

* No return.

CITIES AND TOWNS.	No. of Dogs.	Tax paid.	CITIES AND TOWNS.	No. of Dogs.	Tax paid.
MIDDLESEX—*Con.*			NORFOLK—*Con.*		
South Reading,	65	$69 00	Medfield,	2	$2 00
Stoneham,	157	161 00	Medway,	87	91 00
Stow,	25	29 00	Milton,	110	118 00
Sudbury,	63	63 00	Needham,	67	75 00
Tewksbury,	5	5 00	Quincy,	150	150 00
Townsend,	7	7 00	Randolph,	207	211 00
Tyngsborough,	1	1 00	Roxbury,	231	247 00
Waltham,	249	281 00	Sharon,	83	99 00
Watertown,	20	24 00	Stoughton,	147	155 00
Wayland,	53	61 00	Walpole,	5	5 00
West Cambridge,	146	158 00	West Roxbury,	222	262 00
Westford,	–	–	Weymouth,	259	282 00
Weston,	4	8 00	Wrentham,	142	170 00
Wilmington,	3	3 00	Totals,	2,356	$2,555 00
Winchester,	9	9 00	PLYMOUTH COUNTY.		
Woburn,	188	208 00	Abington,	182	$190 00
Totals,	3,068	$3,335 00	Bridgewater,	96	108 00
NANTUCKET COUNTY.			Carver,	40	44 00
Nantucket,	9	$9 00	Duxbury,	17	17 00
NORFOLK COUNTY.			East Bridgewater,	72	80 00
Bellingham,*	–	–	Halifax,	15	15 00
Braintree,	117	$117 00	Hanover,	50	56 00
Brookline,	57	65 00	Hanson,	18	18 00
Canton,	104	116 00	Hingham,	121	125 00
Cohasset,	53	53 00	Hull,	3	3 15
Dedham,	15	15 00	Kingston,	2	2 00
Dorchester,	238	258 00	Lakeville,	69	93 00
Dover,	–	–	Marion,	29	29 00
Foxborough,	52	56 00	Marshfield,	25	25 00
Franklin,	8	8 00	Mattapoisett,	14	14 00

* No return.

CITIES AND TOWNS.	No. of Dogs.	Tax paid.
PLYMOUTH—*Con.*		
Middleborough,	148	$148 00
North Bridgewater,*	–	–
Pembroke,	45	45 00
Plymouth,	151	155 00
Plympton,	–	–
Rochester,	53	57 00
Scituate,	30	30 00
South Scituate,	59	63 00
Wareham,*	–	–
West Bridgewater,	8	8 00
Totals,	1,247	$1,325 15
SUFFOLK COUNTY.		
Boston,	802	$894 00
Chelsea,	81	85 00
North Chelsea,	4	4 00
Winthrop,*	–	–
Totals,	887	$983 00
WORCESTER COUNTY.		
Ashburnham,	46	$46 00
Athol,	5	5 00
Auburn,	45	45 00
Barre,	31	31 00
Berlin,	1	1 00
Blackstone,	16	16 00
Bolton,	66	74 00
Boylston,	37	37 00
Brookfield,	41	41 00
Charlton,	2	2 00
Clinton,	97	113 00
Dana,	5	5 00

CITIES AND TOWNS.	No. of Dogs.	Tax paid.
WORCESTER—*Con.*		
Douglas,	–	–
Dudley,	57	$57 00
Fitchburg,	61	61 00
Gardner,	4	4 00
Grafton,	78	78 00
Hardwick,	–	–
Harvard,	–	–
Holden,	53	63 00
Hubbardston,	46	50 00
Lancaster,	55	55 00
Leicester,	90	90 00
Leominster,	84	88 00
Lunenburg,	–	–
Mendon,*	–	–
Milford,	7	7 00
Millbury,	83	83 00
New Braintree,	33	33 00
Northborough,	30	30 00
Northbridge,	20	20 00
North Brookfield,	80	84 00
Oakham,	42	42 00
Oxford,	97	109 00
Paxton,	24	28 00
Petersham,	43	43 00
Phillipston,	20	20 00
Princeton,	42	42 00
Royalston,	26	30 00
Rutland,	3	3 00
Shrewsbury,	24	24 00
Southborough,	66	66 00

* No return.

CITIES AND TOWNS.	No. of Dogs.	Tax paid.	CITIES AND TOWNS.	No. of Dogs.	Tax paid.
WORCESTER—*Con.*			WORCESTER—*Con.*		
Southbridge,	74	$74 00	Webster,	51	$55 00
Spencer,	94	94 00	Westborough,	79	87 00
Sterling,	4	4 00	West Boy ston,	80	80 00
Sturbridge,	74	74 00	West Brookfield,	45	45 00
Sutton,	94	110 00	Westminster,	46	51 00
Templeton,	25	25 00	Winchendon,	–	–
Upton,	64	68 00	Worcester,	625	717 00
Uxbridge,	10	10 00	Totals,	3,005	$3,204 00
Warren,	80	84 00			

Mr. GRENNELL presented the following

REPORT ON THE WASTES OF THE FARM.

While agricultural essays, commonly treat of some special subject to the advancement of which the efforts of the writer are wholly directed, or are of a general discursive nature, never failing to set forth brightly the beauties of an agricultural life, it may seem an unusual, and an ungracious task in us to draw out somewhat the other side of the picture; to show some of the obstructions, impediments, annoyances and mistakes to which the farmer is subjected, either by the operations of nature, his predecessors, his neighbors, or himself; and in a form different from any which has come to our notice, to mention the various "wastes of the farm," the cause, the means, and the loss, so far as we can, with perhaps some suggestions as to their prevention. In discussing so limitless and varied a subject, we have taken our materials from every reliable source within our reach, without any particular credit or reference to the authors.

Starting with the postulate, that the profession of agriculture is of prime importance, as being the support of all other trades, occupations and professions, how earnestly should we labor to bring it, and ourselves as its exponents, to the highest standard

of skill and excellence. Have we done this, or any thing like it? Do we, although engaged in what is confessedly the most important, as it is the most wide-spread occupation, prepare ourselves for its pursuit with a care at all to be compared to its magnitude, or to that bestowed by those following any other branch of legitimate useful business? Do we, like the professional man, fit ourselves by a long course of study and examination of principles and precedents? Like the manufacturer, do we calculate carefully the first cost of the raw material, the exact expenditure of time and labor, thereby so ascertaining the value by the cost, and thereby regulating the market? Or do we proceed with that method, that directness of purpose, that certainty of accomplishing certain results by certain operations, which makes the mechanic successful and prosperous? With the negative which rises in response to these questions, we are perhaps told that all these things are not practicable, if possible. It is true that there are certain conditions and elements which are beyond our control; the soil, the climate, sunshine or shade, heat and cold, dryness or moisture, cannot be much affected by our efforts; but under that gracious guaranty that "seed time and harvest shall not fail," do we strive as much as in us lies to attain any high degree of exactness or perfection, in our profession of farming? Granted that our climate is cold; that our land does not spontaneously produce the food that nurtures, or the garments that cover us; that our soil, naturally unfertile, is worn and exhausted; that our houses and buildings, many of them, are old, cold and uncomfortable; and that our means for extensive repairs and improvements are limited;—with all these odds against us, do we yet accomplish all we might, to improve ourselves and our condition?

Do we not find at the very outset a leading cause of loss or waste in the want of education, method and system in managing the farm so as to know the cost and profits of each branch of farming? Is there not an entire lack of accuracy in the details of the business, which of course renders any statement of results or experiments uncertain? For instance, a farmer calling a piece of land two acres, (it may be one and three-fourths or two and one-fourth acres,) hauls upon it so many cartloads of manure, not knowing whether his cart holds thirty

or forty-five bushels. This he ploughs in, as he thinks, eight inches deep, (probably it is six;) he plants a proper amount of corn about three and one-half feet apart each way. He cultivates and hoes as usual, but not keeping any memoranda, he is unable to say exactly how much labor was bestowed on the piece, having forgotten whether the hands worked whole days, or only parts, at that time. When the crop is nearly ready to harvest, with a neighbor he paces off a square rod, as nearly as they can, for an average; the corn is picked, shelled, spread on a garret floor for a week, till he calls it dry, (though from that time till it is merchantable it will shrink fifteen per cent.,) measured up, and the product of the whole field calculated from it. Then with the assistance of "the boys," he estimates as near as he can, the amount of labor expended, and so makes to the "Committee on Grain Crops," a statement of a very large crop at a very small cost. And this is called an experiment, and claims a premium. This occurs every year in almost every society in the Commonwealth. Of how little value is such an experiment; and yet, is it not common? is it not a fair specimen of the experiments and opinions of farmers generally? How few there are who can state with any precision the cost of any crop, or animal; the value of their milk; the quantity required to make a pound of butter or of cheese; the value of the skimmed milk for calves or pigs; the comparative, much less the positive value of different grains, roots and fodder for milk, flesh or wool, separately or together? Does it seem an undeniable proposition that one knowing these facts accurately, or approximating to them in his examinations, must, other things being equal, farm to a better advantage than one who without special attention pursues the course his father took, or varies from that only on some uncertain guess?

What a great advantage to have in one's barn a platform scale, on which hay, grain and stock might be weighed! What a decided advantage a farmer, who was feeding stock, would have in being able from time to time to weigh his cattle, and by weighing and measuring what they ate, to know how they gained the fastest, and when it was time to sell! It would be very satisfactory to weigh one's grain when selling or sending to mill. Then a convenient arrangement for weighing milk, is most desirable; a change of food frequently making a very decided change

in the quantity of milk, which the farmer ought to know, especially in a State where the sale of milk is so extensive as with us, amounting to over eight hundred thousand dollars annually.

Every farmer would find it not only pleasant, but also useful for reference from one year to another, if he would daily note down his farm operations, and perhaps the weather. We know how averse farmers are to writing, but this would not require much penmanship in one of the cheap but useful "diaries" of the day. Besides, in many farmers' families of the present time, there is some one more ready to write than to work; the young women now will sooner pen than spin; work crochet better than butter; and work at the piano, we will not say better, but a good deal more than at the wash-tub or ironing-board. Let such keep the diary. We quote some pertinent remarks by a distinguished friend of agriculture, Rev. H. Colman: "Few farmers keep any accounts whatever; those who do keep them, and are very competent to instruct the community, suffer their modesty or diffidence to overbalance the claims of the public good, which might be essentially served by the exhibition of faithful and exact accounts. More attention should be paid to this in the schools; it would prove of rather more practical importance than to be able to work embroidery and paint artificial flowers, to understand the geography of the moon, and learn from a wood-cut all its continents and volcanoes. It is to be added that agricultural operations seldom admit of that exactness of account which belongs to mercantile transactions, and that it is in most cases only an approximation to accuracy which can be expected.

The importance of this subject to the farmer cannot be overstated, and should not be overlooked. Farmers cannot be too strongly urged to keep exact and faithful accounts with their farms, their animals, and every crop which they raise. It would immensely assist the improvement of their farms and their own personal comfort and self-respect.

It would enable them to decide intelligibly, and with confidence what they had best cultivate, and what avoid; it would reveal to them their true condition, the knowledge of which is essential to their safety, and sometimes save them from embarrassment, bankruptcy and ruin. Accurate accounts of expenses,

capital employed, labor applied, seeds, utensils, improvements, products, and final results, are as important in agricultural as in mercantile transactions.

Of all the wastes upon a farm, perhaps there is none more apparent than that of manures; none more deserving of reprobation, because none other is so generally and directly prejudicial to success in farming, and none other of any thing like the same extent can be so easily prevented. The farmer, somewhat in imitation of the old orator, speaking under different circumstances, if asked what were the three essentials necessary to success in farming, might reply: first, manure; second, manure; third, manure. It is, indeed, the great motive-power in all agricultural operations, especially in the worn and naturally unfertile soils of New England; good and clean cultivation is very important, but without a soil containing the elements of growth, it will avail nothing, and these can only be created or kept up by the constant application of manures. These constitute directly, or assist indirectly, the supply of nearly all the nourishment of vegetable life, while it is these, which, produced chiefly from the decay of animal and vegetable matter, combine most powerfully to give new life and vigor to every form of vegetable existence that springs from the bosom of the earth, by the operations of nature, or artificial application. The acorn from which sprang "the oak, the brave old oak," may be traced back in its germination to the fertilizing properties, and the warmth caused by the fermentation and decay of the leaves and the grass among which it chanced to fall. Nourished and strengthened by this natural manure, it has grown and stretched its great arms abroad, till it is styled the monarch of the forest, and now by the annual decadence of its leaves, adds its annual deposition of fertilizing material to the soil beneath, which in part is again absorbed by its own roots. The golden-eared corn owes its beauty and its vitality to the manure prudently placed beneath the hill. The smallest seeds of all the grasses, and of every herb for the use of man, stretch out their tiny rootlets for the food scattered by nature, or spread by the hand of man. Since, then, manures are of such all-controlling consequence in agriculture, how carefully should we study into their nature and composition; how faithfully should we labor to increase by every means the

production of them; how jealously should we guard against their waste; and how closely should we watch the effects produced by their various application!

Manures possess different degrees of power, partly from their inherent richness, and partly from the rapidity with which they throw off their fertilizing ingredients to assist the growth of plants. These are given off by solution in water, and in the form of gas, the one as a liquid manure, which, running down into the soil, is absorbed by the fine roots, and the other escaping mostly into the atmosphere to be caught by the ever-breathing leaves, or ascending far up, is again brought back to earth by the descending rain or snow. The great art of saving and manufacturing manure, consists in retaining and applying to the best advantage these soluble and gaseous portions. The farmer who should so grossly neglect his crops, either during the cultivation or at the harvest, as to lose or waste one-half, would be scouted at, and almost condemned as criminal; yet how many farmers are there passing for good farmers, who annually lose one-half their manure by neglect; how common is it to neglect the means on which the success of the crop depends! A waste of manure is a waste of the elements, and renders it impossible to realize from the land what one ought in the present, and destroys all prospect of success in the future. One of the most important things, then, to which we can give our attention, is to prevent the waste of manure, and to add all we possibly can to our stock.

By the census of 1860, it appears that there are in the Commonwealth 84,327 barns. The Secretary of the Board of Agriculture estimates the quantity of manure at five cords to each, worth three dollars per cord, making a total of $1,264,905.

If we assume what appears to be liberal, that one-fourth of the barns have cellars, it follows that three-fourths of this manure is exposed to atmospheric and other deteriorating influences. Many competent persons estimate the loss from this cause at one-half, but if it is only one-third, we show a waste from the exposure of the solid manure of $321,635 per annum. But this is not all. When the manure is thrown out exposed, it is nearly impossible to save the liquid portion, which, according to Dr. Dana and the authorities he quotes, is nearly or quite equal to the solid excrements of neat cattle.

According to these data then, the loss of the liquid manure would be three-fourths of one-half of the value of the solid, which would be $459,335. There is then an aggregate waste in this State in the matter of manure from barns alone of $780,974, which might and ought to be saved, and when in addition to this is added the loss of other manurial substances, the bones, shells, soap-suds, and other slops from the house, night soil, &c., it is probable that the farmers of this State allow to waste more manure than they use.

The loss of manure exposed to the weather is both by evaporation and by drainings from the dung-heaps, which, containing the most valuable part of the manure, are allowed to run perhaps into the highway or a brook. The dung is often thrown out of the stable on to sloping land, or left exposed to all weathers in the yard for a long time. Heavy showers of rain, falling upon manures thus exposed, must necessarily, by washing out the soluble portions, greatly depreciate its value. It is well known that the dark-colored liquids, which flow from badly kept dung-heaps, in rainy weather, possess high fertilizing properties. According to the quantity of rain that falls at the time of collecting these drainings, according to the character of the manure and similar modifying circumstances, the composition of the draining of dung-heaps is necessarily subject to great variations. An examination of several specimens of the drainings of dung-heaps, when analyzed by Professor Voelcker, at the Royal Agricultural College at Cirencester, shows a large amount of fertilizing elements most desirable to retain. Humic and ulmic acids are both products of the decay of carbonaceous organic matter; and their abundance in the drainings of dung-heaps is easily explained by the decomposition of the straw and other excrementitious matter; in combination with potash, soda, and ammonia, humic and ulmic acids form dark-colored, readily-soluble salts; the dark brown color of the drainings, then, is an indirect proof of the existence in them of potash, ammonia or soda.

It is also worthy of note that while the affinity of humic acids for ammonia is sufficiently strong to completely prevent its escape at the ordinary temperature, it suffers a change at a slightly elevated temperature, in consequence of which ammonia escapes. Both the solid and liquid excrements

contain salts and phosphates, which the rain and melting snows render soluble, while they wash them away; they contain a good deal of ammonia, and are rich in alkaline salts, especially the more valuable salts of potash, and in desirable organic matter. Manure depreciates very fast by being suffered to lie in the yard. Professor Voelcker found by accurate experiments, that manure lying in the yard exposed to all weathers, lost in value two-thirds; only one-third remaining in one year. Manure may be carted and spread directly on the land, if there is any clay or loam in its composition, but the worst possible method is to haul out manure and leave it in small heaps on the field; the opinion seems to be gaining ground that the best application of manure is to spread it on the land in the fall.

The saving of both solid and liquid manure is a great argument in favor of soiling cows, which ought to be practiced on hundreds of farms in this Commonwealth, where now the cows find but an insufficient pasture. If the pastures were fed to sheep, or young stock, and the cows kept in the stable all the time, and fed with green food daily cut, the pastures would be better, the sheep and young stock would be good, the cows would be in better condition, give more and better milk, and an immense saving would be made of manure now wasted. All the manure which is dropped in the pasture would of course be saved; and also the liquid manure with a little care and labor, by keeping constantly behind the cows muck, loam, or some other absorbant. Farmers generally are not aware of the value of this last. Johnston and Sprengel, learned agricultural chemists, say that a cow annually voids about 16,300 pounds of urine, which contains 961 pounds of solid matter quite equal in value to Peruvian guano at $60 per ton, making the annual commercial value of the liquid manure of the cow to be $28.83; no inconsiderable proportion of her whole value; a cord of loam saturated with urine, is equal to a cord of the best rotted dung. The manure from the poultry, if they are confined, is as good as guano, and should not be wasted; that from the house is the most valuable, and if mixed with fresh loam is completely deodorized.

There are many substances wasted which would make rich fertilizers. There is much from every factory and mill, and from

families. Bones, if thrown into a barrel and covered with ashes and moistened, will after a while, become decomposed, so as to form, with the ashes, a valuable fertilizer, and well worthy of practice in the making. Hard coal ashes, if screened thoroughly, are worth saving, and hauling a short distance to spread on grass land, containing some lime, and some wood ashes remaining from the kindlings, and charcoal. Wood ashes form one of the most valuable of all fertilizers, and ought to be saved with jealous care, and are, at the common prices, a safer fertilizer than any other to be purchased.

The deterioration of pastures comes in as a prominent waste, and is one which for years has engaged the attention of thinking men in the Commonwealth, with less action, and less knowledge how to act, than in any other branch of farming operations. We have elaborate treatises on mowing, tillage and grain lands, and crops; boastful reports of some one solitary acre, that has yielded over a hundred bushels of corn, while perhaps the rest of the farm suffered for the benefits of that favorite acre. We have minute directions as to the best method of ploughing, making hay, raising crops, feeding stock, improving swamp lands, but seldom any practical and proved method of improving pastures. We have all heard of the nameless man who "makes two blades of grass grow where one grew before," but he would seem to have confined his attention to grass for hay. A marked exception to this charge, however, is an able article in the Transactions of the old Massachusetts Society by its then Secretary, from which we shall quote: "Although much has been said, of late, upon the necessity and importance of restoring fertility to our pastures, but little practical information has been offered as to the best and most economical methods of attaining that object. We seem to be afraid to look the evil in the face and to measure the extent of it; a feeling of discouragement seems to come over us whenever we meet to talk about it, and many of our most intelligent farmers seek temporary palliation merely, or else abandon their pastures to their fate, leaving them to go back to their original condition of bush and forest."

The land usually appropriated to grazing purposes has been that which, from its position or its soil, or from the combined causes, is considered the least available for cultivation. Hilly

ground difficult to work, swamps not easily drained, and soils encumbered with rocks, comprise a large portion of the permanent pastures of New England. Besides this, many farmers have been in the habit of cultivating their smoother land as long as it would bear a remunerating crop, applying as little manure as could be got along with, and then laying it down to rye, oats, or barley, so as to get the last ounce of nutriment from the soil. This having been pretty thoroughly accomplished, a crop or two of hay is taken from it, and the land is then abandoned in a famishing state, for a number of years, to pasture. From land thus treated cattle are expected to derive their support for four or five months; they go to it in lean condition in May, and come from it at the end of October, as lean as they went out.

Some of the more obvious reasons for the decline and waste of pastures, that were originally in good condition as such, may be mentioned, as

1. Over-stocking.

2. Turning into the same field every variety of stock, sheep, horses, neat cattle, young and old together, by which the pastures are fed.

3. Allowing bushes, brambles, and all foul stuff to grow to the destruction of feed, especially of the finer grasses.

The mere statement of these causes of evil naturally suggests the remedies. Pasture-lands are considered as profitable, paying a large interest on the amount invested, and hence the temptation to crowd into the grazing ground all the farmer's own creatures, and as many on hire as may be offered by others; this, of course, is done in the spring, without consideration of what may be the supply of feed through a dry summer following. If the pasture is newly laid down, this excessive feeding will be lastingly injurious, and under all circumstances is very hurtful.

The creatures thus depastured may live through the season, but will fail in growth if young, and in flesh if intended for a market. Every beast should be kept in a rapidly growing and fattening condition, whether old or young. If this is not so there is an error somewhere, and it will generally be found in the too great number in the field. Pastures should be so

sparingly stocked that the cattle kept upon them, before winter sets in, can be driven home in good condition for winter fare.

But to the effect of over-stocking upon the pasture itself, and by consequence upon the whole concerns of the farm. If fed down close, the roots of the grass and herbage are first exposed, perhaps to the burning heat of a dry summer, greatly to their injury, and perhaps in a following winter to frosts of extreme severity: thus the destruction of a great proportion of the grass-roots is completed, the finer grasses are killed out, and the coarser and less fattening rendered more worthless. It must be some years before such pastures can be recovered, by great care and judicious treatment. Resulting from this over-stocking is the damaging but too common practice of many farmers of removing their cattle from the pastures in the fall, and turning them into the mow-fields after the crops have been gathered, where they remain till they are housed for the winter. Let the first motto be, feed your pastures sparingly. But not only are pastures injured by over-stocking with cattle, but there is a constant tendency to deterioration from the increasing growth of bushes, weeds, and foul stuff, that deform the land and destroy the feed; the best lands are subject to this evil, and there they will make the greatest encroachments. The first step should be to attack the bushes, briars, sweet-ferns, brakes, hard-hacks, and all sorts of worthless stuff, with the brush-scythe and hog-hoe. These pests, we hardly need to say, destroy the nutritious quality of the grasses, they shade and sour the feed, and exhaust the land. Destroy them, or they will destroy the land. Coarse herbage will gradually displace the fine and more nutritious kinds; briars and bushes come next in nature's rotation, to be succeeded at last by the forest, to which almost all lands tend. The farmer has therefore a continual struggle against this natural law of vegetation, unless he wishes, like the land he cultivates, to return also to his primal condition. This work of extermination is to be repeated once a year, or at least every other year, till the work is finished. There is no better time for this good and profitable labor than some of the last days of August. After a few years these pests will disappear. But this is not enough; some further means of improving pastures may be applied, about which diversity of opinion and practice exists. Something fertilizing must be

employed in some way. In looking back through the ten years of the published Transactions of the Board, we find but few experiments in this branch of farming, and those mostly are of breaking up and reclaiming pasture-land. Now we believe that through the Commonwealth, as a general thing, ploughing up and seeding pasture-lands would be impracticable and injudicious: impracticable, because the best pasture-lands would to a very great extent be unassailable by the plough; and injudicious, because old pastures, if well kept, are decidedly more nutritious, more fattening, more permanent, and, in common phrase, "sweeter feed." After a pasture is made clean of brush and foul stuff, it will for some time, if lightly stocked, remain in good condition; but if reduced by ill usage, it must, we think, be restored by fertilizers applied on the surface. Top-dressing with manure is generally out of the question; there is none to spare from the mowing and tillage, and the expense of hauling it on to pastures, even if there were a sufficiency, would make it impracticable. We believe from our own experience and observations and from that of others, that plaster, ashes, and in some cases guano, may be used with success; three to five hundred pounds of plaster alone, or a less quantity mixed with ashes in the proportion of two bushels of ashes to one of plaster, or of perhaps twenty bushels of ashes alone to the acre, will in most cases revive and renew the pasture, bringing in the white and red clover, and the finer and more fattening grasses. It may be necessary to continue this for two or three years, but we believe that it will be a good investment, doubling the capacity of the pasture for cattle.

The Hon. Henry W. Cushman, of Bernardston, a most careful and methodical man, and earnest in promoting the agriculture of his county, reported to the Franklin County Agricultural Society in 1858 the results of certain experiments on pasture-lands, for which he received the Society's premium. The land was an old worn out pasture, on argillaceous slate, sloping to the east at about twenty degrees, covered with a very light shading of poor grass and pennyroyal. Upon equal plots were sown guano at the rate of 160 pounds, $4.80 per acre; plaster at the rate of 320 pounds or four bushels, $1.60 per acre; unleached ashes at the rate of ten bushels, costing $2 to the acre, May 16, 1858. The effect of the guano was the quickest,

showing very fresh and green, and more than doubling the feed in the early part of the season, but it did not seem to hold out. The plaster gave a great increase during the middle and latter part of the season, and late in the autumn looked green and fresh. Clover also sprang up, and the quality of the grass was much improved. The ashes did not apparently produce much effect in the early part of the season, but after June the grass and clover came in thick and fresh, and continued so all the season; late in the year the grass improved most, and the cattle seemed to prefer the grass on that piece. The conclusion is, that plaster and ashes are valuable renovators of pasture-lands, guano at the cost less so.

But perhaps there is no readier and more profitable way to remedy this waste of pastures than by turning sheep upon them. In reply to the inquiry in the circulars issued by the Board two years ago—Whether pasture-lands were improved by sheep—there was a unanimous affirmative. We cannot on this subject do so well as to quote from the article of Mr. Fay before mentioned. "Our own observation and experience has fully confirmed the correctness of the returns in this respect. We have constantly under our eye an hundred acre lot, upon which cattle a few years ago could not live, that now maintains in good condition a large flock of sheep; and the improvement of the pastures has been so great, that a dozen head of cattle besides the sheep do well on it. The reasons for this are obvious to any one who has observed the habits of sheep: they are more indiscriminate feeders than cattle; they nip the shoots of almost every shrub as well as weed, extirpating many kinds in the course of two or three years; they make room in this way for the grasses to come in where they have been shadowed out or otherwise displaced; the white weed, the broom, or wood waxen, as it is commonly termed, the golden rod, the blackberry vine, the blueberry, with many other similar plants, disappear before them, and the finer grasses and white clover take their place. This, however, is only one of the advantages which sheep possess upon pastures which are impoverished: they scatter their manure in the way to produce the largest benefits; beside which, it possesses in the highest degree the requisites essential for restoring to the land the phosphates which it loses by long depasturing with cattle. The manure of

the sheep, too, suffers no waste, being in a highly concentrated form; and at the same time, it is minutely divided and evenly distributed over the surface of the ground.

"So good and economical distributors of manure are sheep, that experienced farmers in England are feeding them, when in the pasture, with oil-cake, for the additional benefit from the manure."

For the purpose of seeing if our pastures would show by figures, as profitable as we suppose them to be, we have made some calculations as nearly as any reported facts will give.

The whole number of acres of pasture-land in the Commonwealth is 1,326,239, the average value of which according to the last valuation would be $16 per acre, making the pasture lands worth $21,219,824, the interest of which would be $1,273,189. The returns which our pastures yield us, we have tried to ascertain in two different ways, one, to call the pasturing at the usual paying price for all the stock in the Commonwealth, which we can get with any correctness; the sheep, steers and heifers, and milch cows; oxen must be left out of the calculation, as there are no data by which to separate the working oxen, which are not much grazed, from those being turned out for beef; this also does not include any of the horse kind, of which many are pastured a part or the whole of the season.

Pasturing 92,288 steers & heifers 25 weeks, at 25c,	$345,980 00
" 113,110 sheep 30 weeks, at 2½c., . .	84,832 50
" 160,982 cows 20 weeks, at 33c., . .	1,062,481 20
Total rents of pastures, (not including oxen and horses,)	$1,493,293 70

We have attempted in another imperfect manner to calculate the profits from pasturing.

Gain on 92,288 steers and heifers in pastures annually, $6 each, ...	$553,728 00
One-half value wool grown, ...	62,210 60
One-half of the value (not quantity) of milk sold,	404,722 00

Value of all the cheese made, ...	$502,590 00
One-half of the butter, (having deducted the value of cheese.)	657,753 00
Total products of pastures, (not including oxen and horses.)	$2,181,003 00

If these figures are correct they will justify all we have claimed as to the importance of pasture-lands.

The mode of treatment of wood-lands is subject to criticism as a waste, and is of very great importance to the farmers of the State.

It was the prevailing opinion forty years ago, that wood was fast disappearing, and that within fifty years the country would be almost denuded of its woody covering, and that the article would become of great scarcity and value.

At that time the practice was universal to thin out the wood lots, by cutting here and there a tree as they appeared superabundant, or began to decay. Wood so thinned out rarely sprouts out again, or if it does, is likely to be broken down by the subsequent fall of trees, and thus our timber lands would be gradually disappearing, and no young wood lots growing up to fill the vacancy.

But a change of policy, has produced a change of prospect with regard to wood.

The practice of cutting clean as one goes, or clearing the land of timber at once, and making way for a new growth to spring up, has demonstrated the fact that we have nothing to fear as to a further supply of wood.

The subject of planting wood has been a question of discussion among agriculturists, and in some localities it may be worthy of attention, but at present it cannot be said to be a matter of general interest.

But the proper management of young wood lots is worthy of attention.

When a lot of timber land is to be cleared, if the wood is not too old, and the land is adapted or natural to wood, a growth will spring up, exceeding perhaps ten or twenty times the number of trees that can naturally grow to much size on the ground. Some individuals in view of this fact have taken an early

opportunity to thin out all the superabundant trees, leaving no more to grow than sufficient to make a thrifty full-grown wood lot. An observation of years has already shown that this is a wrong policy, and established the fact that nature provides her own remedy for this excess, and applies it in the most successful and advantageous manner. When trees stand thick together, they can grow only in one direction, right straight upwards: which is the direction we all like to have a timber tree grow.

The limbs as they become shaded, die off, and as the more vigorous shoots overtop the weaker ones, they gradually die out and this process goes on, till no more trees are left than can successfully grow on the ground.

The soil in the mean time is kept shaded and moist, and the dead branches and leaves fall down and decay, making the proper manure for the trees, thus securing the most rapid and healthy growth, height and erectness of the timber.

The opposite policy produces an opposite result; by thinning out the trees, the lateral growth of the limbs and the trees have a tendency to grow in the shape of a pasture oak. The ground becomes hard and dry, the decayed leaves will be blown away from the roots of the trees; the sun and wind harden the bodies of the trees, and they become stunted, dwarfed, and prematurely decay.

Striking instances of this have come under our observation, when the same lot of young wood was divided by a sale to different men, and the let-alone policy adopted on one part and the thinning and trimming out on the other. Twenty years made a difference of nearly one-half in favor of the former. Let the young wood lots alone. Keep out the cattle, and do not feel that you are suffering loss because you see a few decayed trees that might furnish fuel if taken out; the damage done by the teams and by the effects suggested above, will more than equal the value of the little supplies you will add to your wood-pile.

These suggestions are the result of observation, now somewhat protracted.

There is a great want of economy in the cutting, preparing and burning wood for fuel. In some parts of the Commonwealth peat is burned, and in the cities and towns coal has

become cheaper, and is commonly used, but having no coal veins in this State, wood must always be the farmer's fuel.

Careful experiments have shown that the amounts of dry wood necessary to throw out a given heat were as follows: Hickory, 4 cords; White Oak, $4\frac{3}{4}$; Hard Maple, $6\frac{3}{5}$; Soft Maple, $7\frac{1}{5}$; Pine, $9\frac{1}{5}$—each equal to 4 tons Anthracite coal. If the heat were all saved, one pound of good dry seasoned wood would raise 27 pounds of water from freezing to the boiling point. The loss is in not saving the heat and in burning green wood.

It has been found that the most thoroughly seasoned wood at common temperature contains about $\frac{1}{10}$ of water. But green wood contains about 35 per cent. of water, and the farmer who hauls in 20 cords of green wood draws 20 tons or 125 barrels of water, and in burning it green loses heat enough in evaporating the sap to boil about 12,000 gallons of water.

Wood will season best under cover and well ventilated; if wood is hauled up green in the winter, it should be prepared so that the winds of March and April and May may season it before it is piled away; and every farmer ought to have a wood-shed large enough to hold a year's supply of dry wood, and never allow green wood to be burned. Not only the economy of the farm requires this, but especially is it demanded for the comfort and convenience of the women of the farmer's household.

We asked a few weeks since an intelligent young farmer to name a principal waste in farming; he replied that to one riding through the country he thought the waste in fences would be one of the most prominent. This is undoubtedly true, not only in appearance to the casual observer but also to the critical, close examiner. The amount of loss by expense of making and maintaining unnecessary fence is enormous, besides the amount of waste land under and directly adjoining them.

We have no exact data by which to estimate the amount of fencing in this State, or the expense. We have, however, made calculations in two ways. Careful estimates have been made of the fencing in Pennsylvania and in Maine. Pennsylvania had, in 1850, one hundred and twenty-eight thousand farms, and the cost of the fencing in the State was $105,600,000; the interest of which is $6,336,000. Maine had forty-seven thou-

sand farms. Her fences had cost $25,000,000; the repairs require $2,500,000 annually; six per cent. interest is $1,500,000, and a renewal once in twenty years would be $1,250,000, making the total yearly expense $5,250,000. Now Massachusetts has thirty-four thousand farms, and we get at the amount of fencing in two ways, by which we arrive at very nearly the same results. By taking about the average cost of fencing on each farm in Pennsylvania and also in Maine, about $700, and multiplying it into the number of farms in Massachusetts, we get about $23,000,000 as the cost of all the farm fences in the Commonwealth. Another way of estimating them is as follows: We call the average size of improved fields throughout the State not to exceed ten acres, in some counties it is less, in some it may be more. There being two millions one hundred and thirty-three thousand four hundred and thirty-six acres of improved land in the State, each of the thirty-four thousand farms will have about sixty-two acres, each of which is subdivided into enclosures of ten acres each, making two hundred and ten thousand eight hundred fields; the number of rods around a ten-acre lot is one hundred and seventy, which multiplied by the whole number of fields gives thirty-five million eight hundred and thirty-six thousand rods of fencing, provided each lot was disconnected from any other, but probably two-thirds of the various lots are connected with others, which enclose unimproved land and highways, which are not included in this estimate; this will reduce the amount about one-third, or to about twenty-three million rods of fencing; and no one could estimate the fences through the State under a dollar a rod; a large part, including most of the stone walls, would cost much more than that. The interest at six per cent. on this sum would be $1,380,000; if we add to that, repairs annually ten per cent., or $2,300,000, and the cost of renewal at the end of twenty years of one-half the whole fencing, we have the enormous sum of $4,250,000 annually for fences, or $125 annually on each and every farm in this Commonwealth.

Let us now consider the cost of fencing different-sized fields. On an oblong field of two acres, the fencing will be seventy-six rods, which, at one dollar per rod will cost thirty-eight dollars per acre; a field of five acres costs twenty-five dollars, ten acres seventeen dollars, one hundred acres five dollars and

thirty-eight cents per acre. It costs as much to fence a ten-acre lot, as it would to thoroughly underdrain it.

And these estimates, too, have all been made on the improved land alone of the State. But the waste is not merely in the cost of the fences and repairing. A large item is the land occupied by the fence, and worthless, because uncultivated on each side. A large part of our fences is Virginia fence, which will measure through the bottom three feet. Bush-riding and staked fences take as much. So that we think that four feet is a moderate estimate for the land under and on both sides of our fences, which is uncultivated, and worse than useless. This would leave on both sides of a fence inclosing ten acres, one and one-fourth acres; on the twenty-three million rods of fencing in the Commonwealth, thirty-one thousand two hundred and fifty acres of land untilled and unoccupied, a refuge for almost every kind of vermin, that walks, flies, or crawls. Might we not dispense with a large portion of this expensive incumbrance? Probably about one-eighth, or nearly three million dollars are in fences on the highway, where we are not obliged to fence animals out, but only to keep in those that are properly there. We believe that it is poor economy and poor farming to allow cattle to graze on tillage or mowing lands; that they ought never to be allowed to run on them; but that when pastures get short, and fail to furnish a necessary supply, the cattle should receive other feed; and there is one great advantage of soiling, or keeping cows up the whole season. Besides, pastures would not get short so soon as they do, if they were not overstocked or if they were properly cared for. This course would then only make it necessary to fence the grazing lands; the division fences between different fields of mowing and tillage being removed, so much time and money might be bestowed on the pastures, which need it badly enough.

Now, without going to the full extent of what is here stated, cannot each one see on his own farm how some improvement in this direction may be made, for if our propositions are true in the whole they are equally so in part.

Numerous fences, crooked, irregular and ragged, crossing the farm in every direction, dividing it into lots of all sizes and almost every form, are unsightly as well as expensive. Where a division fence is necessary, and the material is to be had, there

is nothing equal to a good heavy stone wall; there are some places where a hedge answers a good purpose, and is both ornamental and useful. Wire fences are also made at a cost as low as forty cents per rod, though not of sufficient strength to turn cattle, and running from that to $1.50 per rod; iron hurdles are made in sections of six or eight feet long, joined together by a bolt and nut, which are perfectly secure against cattle, for about $2 per rod. Where it is necessary or convenient to divide off land for grazing temporarily, hurdles of iron, or movable fences of boards, can be used. There are two or three kinds of these last, for which patents have been secured, which are easily set up or moved, and can be made from seventy-five to eighty cents per rod. Where it is thought best to graze sheep or cows on orcharding, mowing, or on a portion of land that is undivided, this portable fence is very useful and convenient, and ought to be brought into more general use. When not wanted it can be easily taken down and stored.

It is a waste for any farmer to raise or keep poor stock of any kind. It costs no more to rear a good animal than a poor one; and it does not cost so much to keep a good one as a poor one; if an animal is allowed to grow poor it costs much more to put an equal number of pounds on him than if he had been kept thriving: indeed, with a sheep it's almost impossible, the old saying being that "a sheep is never twice fat." Mr. Mechi says, "it is more profitable to buy a half fat or thriving animal than a very lean or half starved one. The latter eats more, is longer getting ripe, and you have less weight to sell with a profit; but if you purchase a half fat beast at five cents per pound and get him out of hand quickly at six cents per pound, you get twenty per cent. without cost on what you bought, and in addition are paid six cents per pound for all the fat you have put on. I feel assured that the best bred animals, although at a greater cost, pay better than those which are coarse, badly bred, ill-shaped, large-headed, and big-boned; for, make them as fat as you will, they only command a second-rate price." So, too, in breeding is a waste; farmers are often grossly to blame in not using the best males within their reach for breeding purposes, because, perhaps, it is a mile further off or half a dollar more than an inferior animal owned by some careless neighbor; and so, for that paltry consideration, they waste their

stock by never improving it. In this way a man with a pretty good stock will after a while run it out, when he ought to be improving it. He forgets that well-bred parents transmit to their offspring more of their own bodily and constitutional qualities than ill-bred ones can. As respects cattle, sheep and horses in this country, in most cases the qualities of the male parent predominate in the offspring, for the reason that the males are better-bred usually, having strong and well established characteristics, while the ancestors of a badly-bred animal vary in every possible way, and consequently have no distinctive family characteristic. A thorough-bred ram when coupled with an ill-bred ewe marks his peculiar characteristics very plainly upon the offspring.

An almost equal waste too is not selecting for breeding purposes the best females of our own stock. How often is it that an old broken down mare, or a cow with great defects is put to breeding because she is fit for nothing else. When such a course is pursued by breeders of any kind of stock, they must suffer for their own folly and penuriousness. We quote from "Goodale's Principles of Breeding Domestic Animals," a most valuable and interesting book, which should be in the hands of every farmer. "The neglect which is too common, and especially in breeding horses to the qualities of the dam, miserably old and inferior females being often employed, cannot be too strongly censured.

"In rearing valuable horses the dams are not of less consequence than the sires, although their influence upon the progeny be not the same."

It is a waste too to sell from the farm the crops raised upon it, and which by the rules of good husbandry should be consumed upon the place, to make the manure which contains the essential principles for the production of the next crop, without which or its equivalent the naturally unprofitable soils of New England would too faintly respond to the most earnest calls of laborious operations.

A story is told of a French priest, who, as was common in his country many years ago, while blessing the fields at the beginning of the season, came to one so wretchedly bad as to stagger even his faith. Closing his book he said to the owner, "my son, blessing will not help this field, it wants manure."

Manure then being an essential element, how are we going to obtain it, except from our domestic animals, that from cattle being better than any fertilizer which can be bought. Guano, super-phosphate of lime, ashes, and plaster, all are good in their places, to cause a quick start, a rapid, luxuriant growth, and an early maturity of the crop; as an adjunct to barnyard manure they are most valuable, but they are stimulants, and for permanent effect they lack the organic and other fertilizing properties of dung.

The only object in fattening cattle in Massachusetts at the present time is for the manure. The more meat we make, the more manure we get, the more corn, grain, and other crops we can grow. Without manure we couldn't grow a crop, without the crops we couldn't feed the cattle, without the cattle we couldn't have the manure. The mere statement of this is enough without any argument to prove it, and to show us, as Mr. Mechi says, that a farmer should always send his crops to market on four legs. Hon. John Brooks, of Princeton, one of the most shrewd and observing farmers in this Commonwealth, in a sound article written for the Transactions of the Worcester North Agricultural Society, shows clearly enough that those farmers who draw hay into towns and villages, and haul manure out, make a daily loss by the operation.

This brings us, naturally enough, to consider the wastes from want of economy in feeding, watering, sheltering, and the general care of all stock; a subject sufficient in itself for an extensive essay. Perhaps to the eye of one passing through a farming district in the winter, the most cruel and noticeable waste would seem to be in the insufficient shelter afforded the poor brutes during the inclement season. It is true, and gratifying to know, that a great improvement in this respect is annually advancing in this State. New, tight barns, with warmer sheds, and great cellars beneath for storing and making manures, filled with deep bays of sweet, early-cut hay, with stables full of warm, well-fed, contented cattle, quiet and thrifty, are pleasant places to visit. Now the effect of temperature, the necessity of keeping stock warm and comfortable, has been so often proved in this country and England, and is so seldom questioned, that one is astonished to see cattle and milch cows, as well as young stock, standing nearly the whole of a winter's

day curled up, shivering and wasting their food, by the impossibility of keeping warm.

It has been demonstrated that cattle laid on a much larger amount of fat in proportion to their consumption of food, during April, May and June, than in the colder months. This is consistent with the well-known fact, that the rapid absorption of caloric by a cold and moist atmosphere, renders necessary a larger quantity of food, to keep up the supply of carbon; the food is therefore wasted, which, if the animal were warmer, would be producing fat. We find the fact so in ourselves: exposed to cold, in open, unsheltered situations during winter, our appetite increases strangely, while our weight remains unaltered. Mr. Horsefall, whose admirable essay on dairy stock was published by the Massachusetts Society, and whose dairy is one of the most admirably managed in the kingdom, keeps his stables at about sixty degrees, and neither he nor other good dairymen allow their cows to go out in the cold to drink, as it invariably causes the milk to shrink. It is the opinion of an intelligent dairyman that there is a difference of two quarts of milk a day between a cow comfortably housed, and the same one exposed to the cold for half the day, as we see them.

The young stock, too—calves and colts—when allowed good food and sheltered, will be one-third larger in the spring than if turned out to all weathers, with the coarsest and most innutritious food.

The experiment of Lord Ducie and Mr. Childers in England a few years since, shows that sheep sheltered in a warm shed ate one-fifth less food, and increased in weight one-third more than another lot of equal number and weight, with precisely the same food, fed in the open air. A pen of sheep on Lord Ebrington's farm was sheared early as an experiment; they immediately ate from two to three pounds of turnips each per day more than before, showing their want of a warmer temperature. These facts ought to make such an impression on our farmers as to lead them to keep all their stock warm through the winter, not turning them out except to water, and then but for a short time.

In supplying our animals with suitable food, and in the preparation of it, there is undoubtedly a great waste, though

perhaps there would be a great diversity of opinion as to the extent of it and the means of prevention. No one can doubt that animals will thrive better, make more flesh, milk or wool, on rich food than on poor; or with an occasional feed of roots or meal, and then dry fodder given them in such a way as to have it all consumed, than to be kept on one article the whole time.

Therefore the farmer who feeds nothing but long, dry cornstalks and coarse hay piled into his mangers in such quantities that every morning he has to throw out orts enough to litter his whole stock thoroughly, is suffering or committing a waste, either in his mode of feeding, or in the quality and the harvesting his cornstalks and hay.

We believe there is no question as to the expediency of cutting stalks, both on account of having them better eaten and for convenience in getting out the manure.

However favorably we may think of the further preparation of food for cattle by cutting, wetting, steaming, &c., it is not proper for us to enter into the subject, as it is in the hands of a very thorough, competent, and experienced committee of this Board for next year's Report. We may, however, allude to the fact that the manure made from animals fed on rich food is proportionately more valuable than that from poor food; that while, with hay, Indian corn is here the great staple food for fattening cattle and sheep, some other articles more stimulating and fattening will make stronger manure. Wheat shorts produce milk, linseed meal produces fat, and cotton-seed meal produces both in a higher degree, and makes manure much more valuable than either; by analysis equal to four tons of the best hay. There are two kinds of it, one of which only is fit to feed; that from which the hull is stripped before grinding, is to be had from the Union Oil Company, Providence, and, in the opinion of some of the best farmers and of some of the committee who have tried it, will produce more milk with an equal condition of flesh in cows or ewes than any other feed. Of roots, mangolds will give the greatest yield at the least expense by far, and make a great flow of good milk and improve the condition of the animals.

It is thought that feeding "cobbage," or corn ground in the ear, is a waste; most farmers doubting if the value of the cob

is equal to the amount of toll for grinding, when the miller knows enough to get his two quarts of "clear Indian." There is no harm in repeating a remark found in another part of this paper, that well-fed, well-kept animals are usually not infected with vermin.

But with the food good clear water is essential, and it should be soft. Creatures will not do so well on hard water; it makes the hair rough and staring, and often affects the digestion seriously. Will it be believed that there are yet in Massachusetts many farmers so thriftless, inconsiderate, shiftless, and cruel, as to drive their stock often many rods from the barn to drink at a brook or pond. So long as rain is sent from heaven, no man need be without sweet, soft water for his stock. From 30 to 36 inches of rain fall annually in the Northern States, of which a barn only 30 feet by 40 feet would catch from 630 to 864 barrels during the year, or two barrels a day, which would water a pretty good stock; but it would not be necessary to have a cistern of so large capacity as that, as the water would be always coming in; a cistern ten feet diameter and ten feet deep, holding about two hundred barrels would be ample, and this may be built very cheaply and securely too.

Besides thousands of acres of nominally waste lands, which as such might be reclaimed by draining, there are thousands of acres mowed and cultivated which would be doubled in value by underdraining; whenever water stands in a hole two and a half feet deep, in the spring after vegetation starts, drains will be of use.

In mentioning some of the advantages of underdraining, it will appear that the farmer who neglects this is guilty of great waste. Underdraining prevents drouth; it renders the soil earlier in the spring; it keeps off the effect of frosts and cold weather in the fall, thus lengthening the season at both ends; it allows us to work sooner after rains; it prevents the winter-killing of grain by heaving out; it enables us to deepen the surface soil; it improves the texture of the soil for the use of the roots; it warms the lower part of the soil; it prevents the formation of a hard crust in summer; it creates a circulation of air and gasses through the drained soil most valuable for the food of plants.

There are very few farms in Massachusetts parts of which would not be improved by underdraining.

Where stones are plenty and easily hauled they had best be used, but tiles make the most perfect drain.

The great superiority of fruit trees, grass and other crops on drained land, should commend the subject to every farmer. It is a waste to suffer fruit trees, especially apple trees, to stand yielding nothing of value, and only cumbering the ground.

It is our own experience, and the opinion of all with whom we have conversed on this subject, in which some of them have experimented, that old apple trees, if reasonably thrifty and not too much decayed, may be judiciously renewed and made to bear many years. Such trees should be carefully trimmed and grafted, care being taken not to cut out too much of the top at first. They should be scraped to get rid of the bugs, worms and larvæ which infest the bark, while the land beneath them should be manured and cultivated rather shallow, so as not to disturb the roots. From ten to twenty years' bearing of good fruit may be thus secured, while in the meantime the thrifty farmer will have brought a fine young orchard into bearing.

There is often, too, a shameful waste in the careless, unskilful manner in which fruit trees are transplanted. A small hole, not so wide as the extended roots, is dug in hard soil; the roots, ragged and untrimmed, are crowded in, and the earth tramped hard upon them, no attention being paid to the depth of setting out or the requirements of the roots. Half the trees cannot possibly live, and the farmer complains that his land is n't suitable for fruit.

There is a very considerable waste in harvesting the different crops, aside from that caused by unfavorable weather, and which is unavoidable. The first, and perhaps the most noticeable of these, is to be found in bad management of the hay crop, the most important for us in Massachusetts of all crops, amounting to about $9,000,000, it being not only the largest agricultural production, but even the largest of any single product of the State, of any kind, except woollen and cotton goods, boots and shoes, and clothing. The great and most objectionable feature is that of allowing grass to stand too long before it is cut; becoming too ripe. On large farms, where there is a great amount of hay to be cut, there was formerly

some excuse for this; it was not easy to get through haying, even with an early start, and careful selection of the fittest pieces to be cut, without some of the grass being over-ripe; but by the introduction of mowing-machines and horse-rakes, this excuse no longer exists, certainly not to the same extent as formerly.

After grass blossoms the formation of woody material commences, becoming hard and unnutritious the longer it stands.

Some of the most successful stock-raisers in the State practice cutting their hay very early, commencing even as soon as the grass begins to blossom, and finishing a large crop by the middle of July. The hay thus cut is fine, sweet, fragrant and nutritious. By this early cutting, too, they also get a full growth of rowen, which is very highly prized for calves, milch cows and ewes. We believe that great improvement may be made in some portions of the Commonwealth by attention to this subject.

Grain is often wasted by standing too long in the field before harvesting, the consequence of which is that the straw becomes hard and brittle, and the berry, ripe and hard, shells out in a wasteful manner. Oats, especially, should be cut before the heads are turned yellow, and while the straw is quite green, by which, while the berry will fill to its full weight, the straw will make almost as good feed as hay, especially to milch cows. We think there is often a waste in harvesting corn, in not taking good care of the stalks, which, when properly cured, are worth, to say the least, half as much as good hay.

The practice of harvesting cornstalks is not uniform. Sometimes they are cut up by the root, and at others topped, the top stalks being cut and bound. In either case they want a good deal of drying and care to have them keep well.

An eminent agricultural writer has said that a large part of the errors and deficiencies of our practical agriculture are referrible, in a great degree, to a want of system in management. System relates to time, to courses and to modes of husbandry. A full elucidation of each topic would embrace the whole circle of farming dispositions and duties. Our limits will not permit any thing more than a recurrence to one or two leading ideas. Want of system in agriculture leads to loss

of time and increase of expense. System has chief reference to succession of crops, to sufficiency of hands, and their application to labor, and to selection of instruments.

As to succession of crops called rotation, the more common practice is after two or three years' cultivation to get the land into grass. Rotation as practiced in England has not generally been adopted here. Systematic agriculture also requires sufficiency of hands; whatever call of farming any man undertakes to fill, hands enough to do it well are essential. Although this is a plain dictate of common sense, yet the want of being guided by it in practice, is one great cause of ill success in agriculture. Labor as such never yet diminished any man's profit; on the contrary, it is the root and spring of all profit. Labor unwisely directed and unskilfully managed is indeed a great consumer of the farmer's prosperity. But labor wisely and skilfully directed, can, from the nature of things, result in nothing else than profit. What is skilful management and what is wise direction of labor, opens a field almost boundless, and not to be attempted in this connection; a single remark must suffice. The great secret of European success in agriculture is stated to be much labor on comparatively little land. Now the whole tenor of Massachusetts husbandry, from the first settlement of the country, has been little labor on much land. Is it wonderful, then, that success should be little or nothing when conduct is in direct violation of the principle on which success depends?

The wastes proceeding from the want of system in arranging work, or in improper appropriation of the forces of the farm, although when viewed in individual effect seem small, are very large in the aggregate. The nature of this subject, however, precludes us from making any thing but general remarks, leaving every farmer to act as the occasion demands. Every farmer to be successful should have well-matured plans for performing every operation connected with his business. He can never hope to be successful who goes to work at random. A successful farmer will be a thinking man, always knowing in advance what his operations are to be; when the time comes to act, he will be prepared. He will not, for instance, send thoughtlessly two men to do what one could as well accomplish alone. There is much skill to be exercised in arranging

men and teams to work to the best advantage. In sending off a cart for wood, rails, manure, &c., two men may work to advantage, but if one can do it in twice the time, then the half-hour's travel of the other man each way, out and back, is saved. A shrewd farmer who has outlying fields, would contrive to have the labor performed on them continuously, avoiding all unnecessary travel to and from the house; he would endeavor to avoid all heavy carting, and if possible to use his yard manure near home, using light manure and special fertilizers abroad.

About the house and barn, and especially in doing that unceasing round of most important work concisely expressed in the derivative from that good old Saxon as "chores," system and method are essential, in the division of labor, and in the regular and faithful execution of it in feeding, watering and milking stock, cleaning stables, &c. Numberless illustrations of this subject will occur to every thinking farmer which need not be mentioned here.

When we say that there is a great waste by vermin, we intend to be general in our charge, taking a wide range, placing dogs at the head, and running down to the least insect that torments the steer, or saps the green leaf. The fidelity of the dog is a beautiful thing in prose, or verse, and as almost every family has a dog, eminent for attachment and fidelity to that family, perfectly free from all vice, guiltless of the blood of sheep or the feathers of poultry, we wish it understood that the objections here mentioned against dogs do not obtain against *their* dog, but strictly to every other one in the State.

Passing the everlasting nuisance of a dog in the house, wasting patience and good temper by soiling the clean floors, making his resting-place on the sofa, in the best chairs or wherever most in the way; feloniously appropriating every accessible piece of meat, or pan of milk; worrying the cat and the cows, and destroying the poultry; scratching up the garden and flower-beds for his bone deposits; digging up the meadow for hypothetical moles or suppositional mice; allowing that these are mere trifles, not worthy of notice, we say that the waste caused by dogs among sheep amounts to more than the value of all the dogs in the Commonwealth, even at the exaggerated valuation of their owners, to say nothing of the risk of life and limb.

We quote from a valuable essay by a former able Secretary of the Massachusetts Society for Promoting Agriculture: "Few persons are aware how destructive dogs are in this respect, and they are generally of a worthless kind, which are driven from necessity to destroy sheep in order to obtain the means of existence. The difficulties which beset the cultivator, especially in populous neighborhoods, are quite enough from depredations and trespasses of various kinds, without being obliged to watch his flocks by day and night. One serious impediment to sheep husbandry in this State has been the havoc committed upon flocks by dogs. The returns which this Society have received unanimously ascribe as the reason why more sheep are not kept, the injuries inflicted by dogs. From returns received from all the towns in the State but seven, it appears that in 1859 about 33,000 dogs were licensed, paying a tax of about $36,000; it is estimated that nearly an equal number was destroyed by their owners as not being worth the tax, and that as many more escaped taxation altogether, making at that time over 112,000 dogs, while at that time there were about 113,000 sheep. We have no data to calculate the amount of damage done here. The official returns of the State of Ohio for 1858, show the whole number of sheep killed by dogs was 60,536. Total number of sheep injured by dogs, 36,441. Total damage done to sheep by dogs, $148,748. The "dog law," if properly enforced throughout every town, would prove a great success and signal blessing."

In many parts of the State, foxes are quite plenty, and do a good deal of damage by catching the lambs and poultry that stray away. We know of one farmer, who has told us that his loss in lambs and turkeys, is annually not less than fifty dollars; and his is not a singular case. The only method of prevention is by killing them, and that presupposes a gun and dog, which all farmers do not have, and don't want; then as between the two evils, of having your poultry and lambs killed by foxes, or having on your farm a fox-hunting man with a noisy hound, it is difficult to decide.

There are all the other wild beasts—woodchucks, racoons, skunks, squirrels, with their hoarded stores; against these there is nothing but the gun. Of the birds, the crow, blackbird, blue-jay, and some other small birds are great annoyances,

but it is very doubtful whether it is wiser to kill them or to let them live for the good they do in destroying insects and worms. Probably the best way to deal with crows and blackbirds is to feed them by sowing upon the field, corn soaked soft; they will fill themselves from it, and will not pull the corn much in the hill. Against rats and mice, a good barn cat, if you can persuade her to stay at the barn, unworried by the dog, is an invaluable piece of property. If grain be stowed very closely in the barn, with the buts out, rats will not trouble it much. An excellent arrangement is to have the corn-house completely removed from any other building, and set upon piers or posts, on which is placed a slate stone, or an old tin pan, to prevent the ascent of the rats. The steps by which to enter should be movable, kept within the door, and set up only when used.

The ravages by field-mice upon trees, are sometimes very severe; the usual fall digging and manuring are commonly a sufficient protection. If the young trees stand in a stubble-field, a pretty sure way to protect them is to cast a bank round the tree a foot in height. Care should be observed, however, that the dirt be taken far enough from the tree not to expose the roots, or let the water settle into them. If the first snow that falls in winter is tramped hard about young trees, the solid mass will usually keep mice from the bodies of the trees.

There is no more slovenly sight, and no waste more easily prevented, than that of lice upon cattle, and ticks on sheep. It is impossible that cattle should be thrifty with these myriads of blood-suckers on them; there is no excuse for allowing it. Various expellants may be used, as snuff, whale oil, strong soap suds, sometimes mercurial ointment or unguentum, which, however, is so effectual as often to kill lice, cattle and all. We think the best and cheapest article known is Jaques' Extract of Tobacco, prepared and sold by Fisher & Co., Central Wharf, Boston, in nice packages at very reasonable rates, about an ounce of which, dissolved in a gallon of water, makes a wash easy to use and fatal to the vermin on cattle, colts and sheep. A small piece of sulphur once or twice a week, renders the animal a disagreeable abiding place for vermin. Nor will they thrive on well-fed, well-carded, good-conditioned stock.

All the depredations caused by insects are wastes, and many of them may be prevented by care. It would far transcend

our limits to give even a brief description of the various sorts of insects which injure trees, gardens, and other cultivated crops, and destroy the best productions of the soil. We shall therefore confine ourselves to stating briefly some of the most approved modes of counteracting the ravages and effecting the destruction of a few of those which are the most injurious to the cultivator. The preventive operations are those of the best culture in the most extensive sense of the term, including what relates to choice of seed or plant, soil, situation and climate. Fall ploughing, by exposing worms, bugs, grubs, and the larvæ of bugs, beetles, &c., to the intense frosts of our winters, is usually beneficial. Insects may be driven off, and often their complete destruction effected, by sprinkling over them by means of a syringe, watering-pot or garden-engine, soap suds, tobacco water, decoctions of elder, walnut leaves, lye from pot or pearlash, whale oil soap, or they may be dusted with sulphur, ashes, quicklime and other acrid substances. Loudon says: "Salt dissolved in water is most injurious to insects with tender skins, as the worm and the slug; and hot water, where it can be applied without injuring vegetation, is equally if not more powerfully injurious. Water heated to one hundred and twenty degrees or one hundred and thirty degrees will not injure plants whose leaves are expanded and in some degree hardened, and water at two hundred degrees or upwards may be poured over leafless plants." A preventive against the canker-worm, and some other insects, is to put a ring of tar around the tree to prevent their ascent. Digging around the tree for some feet in extent, and spreading air-slacked lime, destroys the insect and is otherwise beneficial to the trees. The caterpillar, one of the worst enemies to an orchard when neglected, may be easily destroyed by a little attention. When the nests in which they stay are small, they may be easily crushed by the hand or twisted off by a bush or pole, and crushed under foot. The method adopted by one of the committee has proved satisfactory, especially when the nests are out of reach. A lock of tow or cotton wired to the end of a light bamboo pole, is saturated with burning-fluid, and a match being applied it is held under the nest; it burns with a very hot, quick flame, and with a little care will effectually destroy both nests and worms without injury to the tree.

The curculio is a great pest, destroying not only the stone fruits, but also the apple and pear to some extent. There is no protection against them; poultry will eat many, and if all the fruit that falls prematurely is picked up and fed to the hogs, many will be destroyed. The safest way is to jar them at early morning from the trees on to a sheet spread underneath.

The borer is a most destructive worm, not only in the apple tree, but in other fruit trees, and also in the oak, locust, &c. It is a very great waste to allow these in an orchard. Prevention is impossible, but their presence will be shown by the premature turning and falling off of the leaves, and a general unhealthy appearance. They will be discovered in the tree near the ground, and should be immediately dug out with a sharp knife or chisel, or followed up with a pointed wire. Often several will be found in the same tree. This is a nuisance which requires the greatest vigilance in a young orchard.

The scale louse, the aphis, the slug, and the plant louse, are noxious vermin, wasting the trees of the farmer. Washing with whale oil soap, weak lye, soap suds, a solution of subcarbonate of soda, &c., will do much to destroy these. While that is effectual to a certain extent, there is nothing so sure against these wastes as a strong, vigorous, healthy growth, induced by good manuring, and thorough cultivation. Destruction caused by the cut-worm, wire-worm, army-worm, weevil, wheat-midge, corn-midge, turnip-fly, striped-bug, and numerous other pests, can only be helped by the destruction of the vermin, by early sowing, constant care, and other means suggested as the emergency arises.*

The waste from weeds, although not such as can be computed or even guessed at, is undoubtedly very great and should not be passed unnoticed. When one gives a careful survey of his farm, and sees how many weeds are growing in different fields and by the road-side, and that every one of these exhausts the fertility of his soil and the strength of his manure as much as any of his cultivated plants, without rendering him any return, scattering its pestilent seeds in every direction, he realizes a part of the curse imposed upon the original cultivator at his fall.

* For the fullest and most valuable treatise on Insects Injurious to Vegetation, the reader is referred to the splendid edition of Harris on Insects, just published. No farmer's library is complete without it.

The late Sir John Sinclair made some experiments on this subject, which are worthy the attention of farmers. He says: "First, seven acres of light gravelly land were fallowed and sown broad-cast; one acre was measured off and not a weed was pulled out of it; the other six were carefully weeded. The unweeded acre produced 18 bushels; the six weeded acres 135 bushels, or $22\frac{1}{2}$ per acre, which is $4\frac{1}{2}$ bushels, or one-fourth more produce in favor of weeding. Second, a six acre field was sown with barley, in fine tilth and well manured. The weeding, owing to a great abundance of charlock, cost 12 shillings per acre. The produce of an unweeded acre was only 13 bushels, of the weeded 28; difference in favor of weeding, 15 bushels per acre, besides the land being so much cleaner for succeeding crops. Third, six acres sown with oats; one acre ploughed but once and unmanured, produced only 17 bushels; the other five acres ploughed three times, manured and weeded, produced 37 bushels. This experiment proves that oats require good management, and will pay for it as well as other crops. Ten bushels of the increased produce may be fairly attributed to the weeding and the other ten to the manure." It seems by this experiment too that the charlock, or as our farmers call it, "cadlock," is as great a nuisance in England as with us.

In speaking of weeds, they would naturally enough be divided into two classes, one of which increases and multiplies by the seed alone, and the other is propagated only by the root. Those weeds which are reproduced by their seeds may be divided into two classes; the annuals, which spring up, produce and shed their seeds in the same season, and then perish; and the biennials, which spring up the first year, live through the winter and produce their seed in the second year of their vegetation. Neither of these two classes possess long-lived roots; the whole plant perishes as soon as the seed has reached maturity. Those weeds which are produced from seeds can only be destroyed by the seeds contained in the soil being successively brought to the surface and thus enabled to germinate, for otherwise they might remain whole centuries in the earth without losing their vitality.

The number of seeds found in each of the different kinds of weeds, and the length of time that they will lie in the ground without losing their vitality, is marvellous. We can only

mention a few of the most pestilent of them. The dock has to each stalk 13,000 seeds; May-weed, 40,000; charlock, 4,000; burdock, 24,500. There does not seem to be any limit to the period during which these seeds can preserve their vitality. We have known of a piece of gound that had not been ploughed for thirty years at least, which, after the first ploughing in spring, was yellow with the charlock, or "cadlock," as it is called. The dock seed has been known to be in the earth twenty years and then germinate. A blackish earth was found beneath an old building known to have existed over two hundred years; when this earth was spread abroad, a quantity of corn marigold came up all over it, although it had never been seen in that place. The seeds of some plants, too, will preserve their vitality even after having passed through the bodies of animals, and are frequently propagated by the manure. The corn marigold has been thus spread, and the ox-eyed daisy was thus carried across the State of Vermont.

Most of the annuals can be destroyed by cutting them in the proper time, say in August, or by pulling them before any seed has formed; these should either be fed to the hogs then, or be buried in the earth, or a compost pile where they could ferment and make valuable manure. There cannot be a doubt that all those weeds which are allowed to produce their flowers, and then be buried by the action of the plough, tend to augment the fertility of the soil.

The dock should be taken out early in the spring, and great care should be exercised that the seed does not get into the manure.

The other class, propagated from the root, like the couch-grass, creeping bent-grass, corn thistle, &c., must be taken out by the root. It would be idle to mention any more, particularly the various noxious weeds that annoy the farmer. Nor is there any preventive except care about the manure and clean cultivation. Every weed will yield to heavy manuring and careful cultivation, the chief points of which are to kill every one within reach and suffer none to go to seed. When weeds and foul stuff grow in a pasture they will be eradicated by feeding the land with sheep early in the spring to a very large extent; indeed, there is no way so effective to kill off brush and briars, and to renovate the old pastures, as by pasturing with

sheep, difficult as it is to eradicate these noxious plants. We should be very cautious as to the seed we sow. As many as 700,000 weed seeds have been found in a bushel of grass seed. The honesty of growers and dealers in seed is not proverbial; if you find those possessing it, "grapple them to thy soul with hooks of steel."

There is a very great loss or waste in the cultivation of too much land. This remark has been so often made that no one will doubt it, but perhaps the assistance of a few figures will render this fact more visible. It is true to an extent much beyond the common opinion, that the cost of a crop per ton or per bushel is diminished as the aggregate per acre is increased, that is to say, a bushel of corn at twenty bushels to the acre, costs more than a bushel at eighty to the acre, and the same holds true of every product of the land. It follows then that the better we cultivate our land, and the larger yield we get of our crops, the cheaper they will be to us, which is the thing to be sought. And it also follows then, that if we have more land under cultivation than we can properly manure and faithfully work, we shall accomplish this purpose by concentrating our labor and our manure upon a portion only of the cultivated land.

The following facts, prepared from the census statistics by a gentleman formerly occupying a high position in this Commonwealth, are very striking. He says: "In the year 1850, we cultivated two million one hundred and thirty-three thousand four hundred and thirty-six acres, and allowing one acre for twenty bushels of wheat, for fifteen bushels of rye, for sixty bushels of corn, for forty bushels of oats, for one hundred and fifty bushels of potatoes, for thirty bushels of barley, for one and a half tons of hay, for one hundred dollars' worth of garden products, and seven acres for the pasturage of every horse, five for every ox, four for every cow, two acres each for young cattle, one acre for each sheep, and allowing liberally for other crops and uses, the products of that year ought to have been obtained from one million seven hundred and seventy-two thousand five hundred and eighty-one acres; showing a loss of the use of three hundred and sixty thousand eight hundred and fifty-five acres, equal to about seventeen per cent. of the land under cultivation." Now the first waste to be

pointed out here, is the use of this large quantity of land, which if allowed to run to wood merely, would yield an annual average of one cord per acre, or three hundred and sixty thousand cords a year. If this wood be estimated at $1.50 per cord, you have annual waste or loss of $540,000. In the next place this great quantity of land would be much benefited by allowing it to be idle, for it is a general rule that nature yields a growth and improves land at the same time, while that called husbandry, often leaves the land poorer than it found it. Now let this area of wasted land be untouched by the hand of man for forty years and it will yield an aggregate of $20,000,000, while its productive power for the future will be greatly increased.

Then as a consequence, the farmers of Massachusetts fence, plough, sow and mow, six acres where they ought to plough, sow and mow but five acres, and in fine, they extend their agricultural operations over seventeen per cent. more land than is necessary to the result they obtain. Here then is a manifest loss of labor, a waste where there ought to be the strictest economy. It may not be easy to estimate this loss accurately, but it is plain that it naturally diminishes the profits on this branch of industry. The entire cost of our agricultural labor is estimated at $16,000,000; it is moderate to say that one-eighth of this is wasted in the cultivation of seventeen per cent. more land than is necessary to the crop, but to avoid any unreasonable calculations it may be well to put it at one-sixteenth, or $1,000,000. Be it remembered that the gross proceeds of agricultural products did not exceed $20,000,000, and of this at least $1,000,000 is wasted in the misapplication of labor. What would be said of a manufacturer who should be guilty of wasting one-twentieth of his product in the application of his labor! If such attempts finally resulted in bankruptcy would he be entitled to public sympathy or to his discharge? Again, this waste of labor is followed by a waste of land. When we cultivate more land than we ought for the crop we get, the process of cultivation is necessarily defective and bad.

There are thousands of acres pastured that should be allowed to grow up to woods, to supply at some time the never ceasing draft made by our farmers on the forests; and thousands

now mown that should be turned into pastures. The best evidence of this is the fact that the average yield of hay in this State is considerably under a ton to the acre. The best farmers say it is not profitable to mow land that yields less than a ton of hay to the acre; when it falls below that, the land should either be tilled or turned into pasture. The question turns a good deal on the economy of labor. Is it ever considered the amount of travel it requires to get from an acre two thousand pounds of hay, or how much land it is necessary to go over for each and every single pound? If the grass yields two thousand pounds to the acre of hay, twenty-two square feet are to be mowed over and raked over to obtain one single pound.

In every business department of life in which we are engaged, a successful prosecution of business requires judicious and careful outlay of capital, and by thus doing to secure the largest returns on the investment. Now the farmer should recollect that his capital is composed not only of his farm and his cattle, but also to a very considerable extent of the labor which he bestows upon the land and the stock, and therefore it behooves him to see to it that his capital is not wasted by labor injudiciously expended. It is a duty to economize labor; labor is the scarcest and dearest commodity in the market, and is likely to continue so.

Another waste, which, though very extensive cannot be computed, but ought not to pass unnoticed, is the neglect of early repairs on buildings, fences and tools. How few farmers are fully up to the mark in this respect. Every one should have a set of tools for repairs and carpentry work; a plane, shave, augers, chisels, brace and bits, and gimlets, which he ought to know how to use; these and a few other tools such as wrenches, cold chisels, a sledge, stone hammer, drills and powder-can are very handy and save a deal of running. He ought also to have in separate boxes, nails of different sizes, a few screws, and some different sized carriage bolts, costing but a few cents each, and with which one can make a strong, neat job, instead of toggling up with an uncouth clamp, or wooden pins. But it is no use to have these tools without a proper place in which to keep and use them; but with that, a farmer of any gumption will on rainy days do up many a piece of

repairing that would have cost him half a day's journey to the blacksmith, wheelwright, or carpenter, and something to pay besides. Many such items of expense too would be saved if more care was exercised in housing and protecting from the weather all machines, implements and tools,—to have them every night cleaned and put in proper places.

One of the shrewdest, closest and best of our hill farmers in the State, said to us, "We farmers don't think how much we lose in not having a few handy tools by us for repairs. The time, travel and patience wasted in borrowing and returning necessary orconvenient tools, would, at a fair calculation, pay for them." A great trouble is, however, that many farmers and farmers' boys, abuse and neglect tools of all kinds; but with such as we have mentioned properly kept, a farmer may keep his buildings and most of his implements and tools in repair. It makes a vast difference, too, about having such jobs done, if the tools are convenient. If the hammer and good nails are handy, the man or boy will be much more likely to nail a loose board on the barn, or tack a shingle, or drive on a fence board, than if he has to use an old harrow tooth to pound with, and old wrought iron nails, rusty, crooked and broken, saved from some old torn-down shed of a former generation. Prompt attention in this respect is especially necessary in repairing fences. As soon as a gate begins to sag, destruction commences, and it should be righted before it is racked to pieces; if a rail is thrown off or broken, or a fence board off, a cow will have her head over or through, and the fence down in a short time after. There is no way so effectual to make breachy cattle, as by neglecting early rapairs on fences, and there is no greater nuisance on a farm than a herd of cows and cattle, which have thus been successfully educated to disregard party lines.

In addition, however, to these small items, there is one great waste, which covers and permeates every department of the profession, and which obtains to a greater or less extent on every farm. It is the misdirection of physical force; or physical power applied without a sufficient degree of skill or scientific knowledge to make it available to the largest extent, under existing conditions. The simplest illustration of this neglected principle is perhaps the common lever. How often have we

seen the whole might of a huge Milesian thrown ineffectually upon a lever, which the skill of an American lad would at once render serviceable. The highest display perhaps is exhibited in the steam-engine, powerful almost beyond limit, yet controlled by a touch.

On our own land we see its wide extremes. The dusky squaw, the aboriginal tiller of the soil, with a rudely-shaped stone, planted her few grains of maize in the virgin soil, and with an ignorant but truthful confidence, waited till the Great Spirit—He who "sends his rain upon the just and the unjust," who had long ages before promised that "seed time and harvest should not fail" upon the earth,—should with his genial sun, his gentle dew and rain from heaven, bring forth "the blade, and then the ear, and after that the full corn in the ear,"—

> "Till at length a small green feather
> From the earth shot slowly upward,
> And before the summer ended
> Stood the maize in all its beauty,
> With its shining robes about it,
> And its long, soft, yellow tresses.
> And still later when the autumn
> Changed the long, green leaves to yellow,
> And the soft and juicy kernels
> Grew like wampum, hard and yellow,
> Then the ripened ears she gathered."

She parched the scanty product of her cultivation and cracked it in some water-worn pot-hole of the rocks, while her red-skinned partner, if successful, struck the straggling deer, or speared the silvery salmon.

From this normal style of cultivation and of life—this lowest exhibition of physical force as applied to produce the necessaries of life, how have we advanced step by step, as science, like the eastern sun, has gradually risen on us, dissipating the darkness, quickening every energy and shedding light in the dark places. What an immense advance has educated labor made, and how wonderfully it is developed in our knowledge of the nature of the soils, their capabilities and their deficiencies; the nature of the multitude of plants, their requirements and how to supply them; our ingenious and almost perfect tools, implements and

machinery for tilling the soil, and preparing its products for the use of both man and beast; our beautifully perfected breeds of cattle, and other domestic animals;—all these show what may be accomplished by continued efforts skilfully conducted. And yet between these two extremes, what farmer is there who will not admit, from year to year, an uncertain amount of loss of labor, strength and time, which are his capital, by not knowing exactly the best way to accomplish certain results, or if knowing, by inability of one kind or another, failing to carry out what his knowledge suggests should be done.

How many farmers are there, who thoroughly understand the nature of the different soils of their farms, of which there are several, if the farm is of an average size? In high farming this is regarded as an essential, prime condition—a necessity to be understood, both for the crops to be grown, and the beasts to be kept; on the character and effect of the food for animals. How many farmers know the character of the underlying subsoil, and the untold values in it, whether most profitably brought to the surface and spread, or stirred beneath, or left in its normal condition? How many farmers are there who know the true depth at which to apply manures? How many who know and pursue the most judicious rotation of crops? how many who can tell the absolute value of different manures?

What we want is a more general diffusion of knowledge, more careful and systematic observations and experiments, with accurate and methodical reports, from which as data we might be able to deduce some laws to guide us.

There are especially some sciences, with which we as farmers, ought to hold a large acquaintance, Geology, Botany, Physiology, and Chemistry. It is not meant that we should be professors in all these sciences, but that the more we know of them, and can combine with our practical knowledge, the more skilful farmers we shall make. Geology teaches us that our soils are rocks ground into powder, and mixed with animal or vegetable matter; it teaches the character of our rocks, the lay of our land beneath the surface, as well as above, the nature and capacity of our soils and subsoils.

From Botany we derive all our knowledge of trees and plants, what are most suitable for food for man or beast; it has taught

us to form from a wild European crab, the splendid Baldwin, Greening, Nonesuch and Pippin; from a vile choke pear, the Seckel, the Bartlett, the Duchesse, and all that delicious class; from a miserable Persian plum, the luscious Peach, Apricot, and Nectarine. Animal physiology has taught us how from the roving bison we may breed perfection in our Short-horns, Herefords, Durhams, and Ayrshires; from the wild argali bounding from rock to rock, we have wrought out the Leicester, the Cotswold, and the matchless Downs; while the wild boar of the woods is modified into the Mackay, the Suffolk, and the Chester County.

Agricultural chemistry intimately connected with all the others, shows us the requirements and the deficiencies of our soils, how our seed should best be sown, harvested and prepared for the most economical use of ourselves and our animals; it teaches us the composition and nature of our grains and roots, and shows us how they minister to the different organisms of animal life, and which is best adapted to build up and to strengthen each different portion of the system.

The question is even now often mooted whether farming is profitable. It may or may not be according as it is managed with skill or otherwise. And the affirmative answer to that question will very much depend on the attention paid by each farmer to the subjects here presented; and his skill in avoiding and preventing them will largely measure his success. To farm well, one must farm intelligently, and how few they are who are thoroughly good farmers. The difficulties in the way of farming well are not few nor small; difference in climate, even in New England, locality, soil and subsoil, skill enough to select one from the various breeds of cattle for the dairy, or the shambles; how to raise them, and how best to fatten them; whether to keep sheep or cattle, horses or hogs; how to prepare compost, and use manure; a judicious selection of the crops most profitable in each locality, and a proper rotation of crops; skill in fitting the ground, getting in the seeds, and cultivating and harvesting the crops; these are all more or less obstacles to be overcome by study and experience. Success or failure may result from the exclusion or permission of the "wastes" of the farm.

The judicious cultivation and management of a farm, requires a combined and practical exercise by the farmer of all the knowledge and skill necessary for the cultivation of the articles separately that are produced on the farm.

It is obviously a different science from any other, more complex, more difficult to learn, requiring judgment, experience, and observation, to carry it into successful practice. Next in value to an individual's own experience, is a true and particular account by others, of a judicious and skilful cultivation and management of farms like his own, where the expense of labor, markets for crops, and habits of living are nearly the same, if he can have their method and practice fully and accurately communicated to him.

Another great obstacle to farming well, is the want of capital, which induces a waste. Many a young man having accumulated a few hundred dollars by working on a farm, is prompted by a laudable ambition to buy and act for himself, makes a purchase of one for which he becomes largely indebted, ornaments it with a mortgage and skins the farm to pay interest, Another common case is that where a farmer dying, one son takes the farm to manage and pays off the other heirs; to do this he is to have money, a part of which he gets by selling every thing he can; perhaps slashing into a valuable wood and timber lot, or disposing of a choice lot of meadow and mortgaging his farm for the remainder; having thus a continued debt to pay hanging always on him. In each of these instances, which are by no means rare, a young farmer commences life with a burden heavy to be borne under any circumstances, and which is likely to be increased by sickness, or the failure of a crop, or the loss of his animals; and of all farm wastes, perhaps there is none more consuming than paying interest money. John Randolph once declared he had found the philosopher's stone, the secret of living, it was "pay as you go." A false and ambitious style of living is creeping in among the farmers, as foreign to their real wants as it is to the way of life of those who preceded them and the manner of their own "bringing up."

Events crowded into the past year, strange in their design, inception, execution, and results, beyond our wildest imaginations, have tended to inspire us with a greater respect and

veneration than ever for the science of agriculture. When the rebel spirits of the South, whose only precedent for their foul deed was found in that primeval revolt, which "peopled vastly hell," and led to "man's first disobedience and his fall," raised their infernal flag against this sacred Union,—when by the suddenness, the extent, and the virulence of their demonstrations, trade, commerce, manufactures, and every free institution was threatened, the farming interest stood forth with a prominence heretofore unequalled. It was felt that the farmers of the North and West could send out their thousands to the battle-field, and from their harvest fields could not only sustain themselves and their armies, but could feed, if necessary, the starving millions of that nation from which we sprung, but which has not shown to us in our hour of trouble, the sympathy we had a right to expect.

There was never a time in our history when it was more imperative on the people to study closely their agriculture; to raise to the fullest extent all paying crops; to practice in all respects the strictest economy; and, restricting superfluities and luxuries, to return to some extent to the frugality, the simplicity, the virtue of earlier years, from which we have wonderfully departed.

History teaches us how gradually a prosperous and thriving people, rising from the bare necessities of life to required comforts, pass to coveted conveniences, lapse into enervating luxuries, and decline into national dissipation and vice, "touched by the mortal finger of decay," they crumble by their own corruption, or are swept by some more fresh and vigorous successor out of their existence.

Who shall say that the all-wise Ruler of nations has not suffered this monstrous and unnatural rebellion to raise its matricidal hand against this benign government for the purpose of developing courage, self-denial and patriotism, those stern virtues that made our fathers successful and us great, and to save us from the fate of Imperial Rome once the mistress of the world, to be forever lost among nations, or to sink into our original position as an English dependency.

JAMES S. GRENNELL.
FREEMAN WALKER.
JOHN C. BARTLETT.

Mr. STOCKBRIDGE presented the following

REPORT OF COMMITTEE ON WHEAT CULTURE.

Your committee, deeming it important to obtain information from intelligent practical farmers in different parts of the State, in relation to the cultivation of wheat, distributed a circular to them, propounding the following questions, viz.:—

1. Is wheat cultivated in your town and vicinity? If so, to what extent?
2. What kind of soil is preferred for the crop?
3. Which succeeds best, spring or winter wheat? Name the kinds that for yield and quality, are generally preferred?
4. Do you prepare your seed in any manner for sowing? If so, what are its advantages?
5. Are your lands generally manured for wheat? If so, what manure is used, and how applied?
6. What obstacles do you encounter in its cultivation?
7. What specific means do you employ to prevent or avoid the various diseases and mishaps of the crop?
8. What instrument do you use in covering the seed?
9. Have you had any experience in drill-sowing? If so, please state the result?
10. What, in your opinion, is the average yield per acre in your vicinity?
11. Has the crop been injured the past season by the louse that has infested our fields?

We are under obligation to the following gentlemen, who returned our circulars with very full and suggestive answers, viz.: John T. Z. Thompson, Halifax; Samuel H. Bushnell, Sheffield; Horace Collamore, Pembroke; J. S. Purple, Gill; Austin J. Roberts, Lakeville; E. W. Gardner, Nantucket; James M. Knowles, Eastham; S. F. Dudley, Shutesbury; Elihu Belding, Whately; C. Parsons, Conway; Henry Colt, Pittsfield; E. W. Stebbins, Deerfield; Otis Gunn, Montague; H. A. Fuller, Springfield; Henry W. Cushman, Bernardston; James Howard, West Bridgewater; Ira B. Maynard, Leverett, and Joseph Kingman, West Bridgewater. The information thus obtained, we have endeavored to embody in the report, and thus to dispense it to the farmers of the State.

Your committee, although endeavoring according to their ability, and the time and means at their disposal, to discharge the duty which the Board assigned them, have not considered it important or desirable to undertake critically, or to any great length, an investigation of the various diseases and enemies of the wheat plant, or of their causes and remedies. The most thorough and elaborate examinations have been made by naturalists and scientific men on the diseases and enemies of wheat, and the full result of those examinations given to the world. A committee of the Board, also, have the diseases of vegetation under their especial examination, who will undoubtedly make a thorough investigation of the diseases of this important grain. We have therefore endeavored to make some inquiries into the causes of the comparatively rare cultivation of wheat in this State, its present condition, its future prospects and encouragements.

Massachusetts is within the limits of the wheat-growing regions of the world; yet wheat is not one of our staple crops. And though Canada, on the north, raises on the average between sixty and seventy millions of bushels annually, and New York, on the west, and Pennsylvania, on the south, raise large quantities for exportation, we, in Massachusetts, do not produce enough for our own bread. With a climate and soil essentially the same as that of countries where this cereal is successfully cultivated, producing not only enough for home consumption, but also for large exportation, we yet fail to raise it in any considerable quantity, and purchase in other States nearly all we consume.

In Great Britain, six bushels of wheat are allowed for the usual consumption of each inhabitant. In this State, we undoubtedly consume more. But taking this as the data, our population yearly require six million eight hundred thousand bushels for their sustenance. Of this quantity, there is raised on our own soil, according to the returns of 1855, but forty thousand three hundred bushels. We are therefore obliged yearly to purchase abroad six million seven hundred and fifty-eight thousand four hundred and ninety bushels, at a cost of more than ten millions of dollars. According to the returns of the last industrial statistics, we cultivate, on the average, two thousand six hundred acres of wheat. But to produce enough for our bread, would require four hundred and twenty-

two thousand four hundred acres. At first thought, these items are apalling; yet it is believed that by proper modes of cultivation and effort, the farmers of the State can produce every thing necessary for the sustenance of its people. And agricultural and State pride should spur them persistently to the work.

It may be said by some doubter that our soil and climate are such that we had better engage in manufacturing and mechanical pursuits, and exchange the products of our labor in these branches of industry, for our bread stuffs. This question it is not proposed to argue to any length here. But it is extremely humiliating to our feeling of pride and independence to know that we are indebted to any body for the staff of life. It is true of States and Nations, as of individuals, that those are most truly prosperous and powerful which rely solely on their own exertions and skill to produce a supply for all their varied wants. Colman justly remarks, that "An agricultural community should, as far as possible, produce every article of first necessity, which they require for consumption. There may be products utterly unsuited to their soil and climate, but in all cases, and always, when there is no obstacle absolutely insurmountable to persevering labor, success is a moral gain. In a pecuniary view, however, there can be no doubt that Massachusetts would find her account in producing her bread from her own soil. Vast sums of money are now sent out of the State for bread. This capital, applied to the improvement and cultivation of her own soil, would immensely increase its productiveness. Labor, judiciously and liberally applied to agriculture, produces not merely the immediate and particular crop sought for, but has a cumulative influence in preparing the same land for other and larger crops. The value of the land thus cultivated is often doubled, quadrupled, and increased ten-fold, by being thus rendered more productive."

Another important consideration is the fact that the native qualities of the great wheat regions of the West, for growing wheat, are becoming exhausted by constant cropping, and unless some new modes of cultivation are adopted, will soon fail in their ability to furnish our supply. A few years ago, Delaware, Maryland and Virginia were great wheat-growing States. Now it is cultivated there to a limited extent, and with indifferent

success. Sections of New York, which formerly produced thirty bushels per acre, have been so reduced by this process, that they do not now produce more than eight. Ohio does not average over thirteen bushels per acre, and Illinois but seven. If this process continues, the time is not far distant when all the wheat they can raise will be consumed at home, and we shall, from necessity, be compelled to produce our own, or use other grain as a substitute. Would it not be wise, then, while we foster industry in mechanics and manufactures, to engage with spirit and enterprise in the raising of our bread stuffs, and by the light of science and experience learn to do it with success.

The facts abundantly warrant us in the opinion, that wheat can be successfully and profitably cultivated in this State. A little more than a century ago it was one of the common, ordinary crops. Sufficient was raised for home consumption, and it was an article of export. A history of the commencement, progress and decline of its cultivation, might be interesting and profitable, but necessity compels us to pass over it in a cursory manner.

The first wheat planted in the soil of Massachusetts, and probably of the continent, was by Gosnold, in 1602, when he first explored the New England coast. He landed on the Elisabeth Islands, and to prove the soil, planted pease and beans, and sowed wheat, barley and other grain. This was eighteen years before the arrival of the Mayflower. The first settlers of the Plymouth Colony brought no seed of wheat with them for sowing; and their crops for several years were Indian corn, barley, and pease.

The settlers of the Massachusetts Colony, who arrived in 1628, among other grains, seeds and plants, brought over a hogshead of wheat in the ear for sowing, and as soon as the first rude preparations of the settlement were completed, its cultivation was commenced. The new grain seems to have taken kindly to the soil and climate. No mention is made for many years of any want of success in its cultivation. On the contrary, its growth was so successful that it soon became an important article of export from the colony, and laws were passed to regulate the trade in wheat. At a "Generall Court held at Boston the 7th day of the 9th Mo 1641, it was voted that a deputy of every

towne should send in writing to Capt. Gibons the 21st p'sent, what wheate wilbee adventured to bee ready by the first of the first month, and who will undertake for the towne." At the same session of the Court, the following Act was passed:— "Forasmuch as it appeareth to this court, that wheate is like to bee a staple comodity, and that a ship is wth all convenient speed to bee set fourth and fraited with wheate, for the fetching in of such forraine comodities as wee stand in need of, it is Therefore Ordered; that after the last day of this p'sent 8th month, no baker or ordinary keeper, or other p'son, shall bake to sell, or set for sale, any bread or cakes made of wheate meal, or wherein any wheate meal shall bee put, upon paine to forfeit double the valewe thereof. And the Cunstables of every towne are hereby required to see that this order be observed and that they make seizure of all such bread so set to sale and distribute the same to the poor."

In October, 1648, a law was passed making wheat a legal tender, and ordering it to be received in payment for taxes at five shillings per bushel. This law remained in force, with occasional changes in price to correspond with the supply, for about a century. It is a significant fact that the price of wheat thus fixed by law, was often the same as that of Indian corn, the native grain of the country, and rarely more than two shillings per bushel higher. And that price was generally from three shillings to five shillings sixpence. The "Great and General Court," from year to year, determined the price at which it should be bought and sold, and as it was a staple article of food, watched with Argus eyes, the yearly crops and supplies, that if possible, enough should be on hand for the sustenance of the colonists, and new emigrants who were continually arriving. At times, it was permitted to be exported, and again its exportation was interdicted. Occasionally, it might be brought in, in foreign ships; then, "taking into their serious consideration the great necessitye of upholding the staple comodityes of this countrye for the support of the inhabitants thereof," it was forbidden to import it.

In May, 1662, the Court passed an order in the following words: "The Court being informed by the deputyes of the seueral townes that bread corn is scarce amongst the people, and that seueral ships and passengers out of England are

arived and more dayly expected, wth the consideration of supplying the fishing trade and others, doe therefore order and declare, that no person or persons shall export out of this jurisdiction any wheate or wheate-flower, after the 25th of this instant m^{o} upon penalty of confiscation thereof unto the country, one fowerth part whereof shalbee to the informer. This order to continue in force untill the Gen'll Court or Council shall take further order."

In November, 1675, it was enacted as follows: "The Court, considering the present state of affairs amongst us in respecting the Indian warr, and what hindrance the same may bee to the raysing supplyes of prouissions amongst ourselwes, Judge meete that the law prohibiting importation of wheate, biskeet and flower, be suspended as to the particulars above mentioned until this Court take further order." Notwithstanding the interruption to husbandry this year (1675,) by King Philip's war, the records speak of large crops of wheat in the State, especially on the "Quenecticott;" and it was when on their return from threshing the crop in the town of Deerfield, that "eighty young men, the flower of the county of Essex," were slaughtered by the savages at Bloody Brook.

No mention is made in the Court Acts or Records of those early times, of any failure of the wheat crop, from disease, or unsuitableness of soil and climate for its cultivation. It grew luxuriantly on the newly cleared lands; and was often sown for several successive years on the same field, after taking off the forest; and continued to be the chief crop, until by constant cropping without manuring, the lands failed to bear this grain.

Jared Elliott, in his "Essays on Field Husbandry in New England," published about 1760, speaks of the complaints made by farmers of the failure of their wheat crops, and imputes it to thriftless husbandry. He very frankly tells them that if they would spend less time in complaining, running about, and moving to find new and unexhausted lands, and more in manuring, and thoroughly cultivating the farms they now have, they would have no cause to complain of their crops. He says: "We find land will yield wheat best, when it is ploughed three times. An old and experienced farmer recommended deep ploughing, even on thin, shallow lands. Thereupon I ordered a piece of land to be ploughed so deep that our

farmers thought I had spoiled our land. I have had wheat twice on that land, and think the deep ploughing did no hurt, but good."

Passing over a period of nearly three-fourths of a century, during which its cultivation was pursued with indifferent success, notwithstanding the efforts of the older agricultural societies, especially of the Massachusetts Society for the Promotion of Agriculture, to promote its cultivation by the almost yearly offer of large premiums, its cultivation grew less and less, until we find, that about 1830, it had ceased to be a common crop. A field of wheat was rarely seen in any part of the State; in fact it had become quite a curiosity, and we were, as a State, entirely dependent on other countries for our breadstuffs, except the coarse kinds. This disgraceful fact was urged upon the attention of the legislature from year to year, until, in order to ascertain the cause of the failure, and if possible to find out new modes by which it might be successfully and profitably cultivated, an Act was passed in March, 1838, as follows: "That there be allowed, and paid as a bounty, to the person who shall raise fifteen bushels of well-cleaned wheat, the sum of two dollars; and for every additional bushel above fifteen bushels, five cents, from the treasury of the city or town where such person shall reside. Also, the sum of one hundred dollars to the person who shall raise the greatest quantity in one year of not less than five hundred bushels, on one farm."

The passage of this law called the attention of farmers to its cultivation in good earnest, in all parts of the State. There were applicants for the bounty in nearly or quite every town; and the number of persons to whom the bounty was paid, the first year of the law, was 3,642; the amount of money drawn from the treasury of the Commonwealth was $9,280. There were cultivated that year 6,846 acres, yielding 108,570 bushels of wheat. The highest average yield in any county was in Worcester, of sixteen bushels per acre. The smallest average yield, in Nantucket, of ten bushels. As a fact showing the universality of its cultivation that year, it may be stated that in the town of Pittsfield, Berkshire County, there were two hundred and twenty-one farms, on one hundred and nineteen of which wheat was raised. During the second year of the

law, $8,999 were paid in bounties, and $4,277 the third year. The law expired on the 3d of March, 1841. The experiment, as this result proves, was a failure. And although each claimant for the bounty was obliged to make a minute statement of his process of culture, no new light was obtained of practical importance. There was much complaint of injury to the crop by drought, grain insect, smut, &c., and but little enterprise and perseverance shown in continuing its cultivation. As a consequence, from 1838 to 1845, the crop fell off forty thousand bushels, and its general cultivation soon after ceased.

From this glance at the history of wheat culture in our State, notwithstanding the many discouraging aspects of the case, it is evident, first, that a large share of our soil, when uninjured by cropping and exhausting cultivation, is capable of bearing highly remunerative crops of this grain. Second, that the enemies of the plant are no more numerous or destructive here than elsewhere. Third, that our climate is not unsuitable. It has not changed perceptibly in the last two hundred years, and is nearly identical with that of wheat-growing sections. In further proof of this position, it may be adduced that it is the universal testimony of the present and past generations of farmers, that wheat will grow finely on all new lands not subject to inundations and great structural changes by frost. Also, that there have always been farmers in nearly every part of the State who have judiciously pursued its cultivation with unvarying success.

In 1838, a farmer in Essex County says: "I have raised wheat on my farm every year since 1812, and with uniform good success. Have always sown spring wheat, and on land in good condition." The same statements are made by farmers of that time, in Middlesex, Hampden, Hampshire and Franklin Counties. It is true, that wheat is not one of the hardier kind of plants. It is badly injured by drought, by the early and later frost. Insects prey on it, and disease destroys it. Like the rest of the vegetable kingdom, it has enemies to be guarded against, and laws of life and growth to be obeyed, or it ceases to flourish. These facts sometimes caused the loss of a crop and had their influence, but in our opinion the great controlling reason why wheat was so little cultivated here during the latter part of the last century, and the first half of

the present, was, that the native fertility of our older fields, necessary for wheat-growing, had become exhausted; and the few attempts made to renovate them for its culture, were, by methods and manures, injurious to the full and healthy development of the plant. The mere fact of its liability to disease, to destruction occasionally or frequently by enemies, will not account for its non-cultivation. The rot has occasionally turned our potato fields into a nuisance, that were giving promise of a bountiful harvest, and thus blasted the farmer's hope. The frost frequently, at one fell swoop, cuts off nearly all our fruits, when the trees are growing luxuriantly. Our corn fields are injured by frost, blast and smut, when their growth gives indication of abundant crops. And drought often causes all our productions to give us but a scanty supply. And yet no one thinks it best to cease the cultivation of these products, so long as the power of the earth to produce them has not failed. These causes and results are transient as the various changes of the seasons, and may occur only at long intervals. But if the soil, as is found in the survey of our wheat culture, refuses for a long series of years to bring forth its product, an effectual stop is put to all success, until it is renovated.

Since 1855, unceasing efforts have been made in all parts of the State, to increase its cultivation by new methods of culture and fertilization. The agricultural societies have, most of them, offered yearly premiums to encourage farmers to engage in this branch of husbandry, and with success. The following is the sum paid by each society in 1861:—Hampden East, four dollars; Hoosac Valley, seven dollars; Hampshire, six dollars; Worcester South-East, six dollars; Plymouth, thirteen dollars; Franklin, five dollars; Hampshire, Franklin and Hampden, one dollar; Middlesex, five dollars; Martha's Vineyard, seven dollars; Worcester West, four dollars; Norfolk, six dollars; Worcester North, ten dollars; Middlesex North, six dollars; Nantucket, eight dollars; Housatonic, nineteen dollars; Worcester, four dollars; Essex, eight dollars; Bristol, six dollars. The societies that offered no premiums were the Highland, Hampden, Barnstable, Berkshire, Massachusetts, and Worcester South. Most of the gentlemen who answered our circulars say, "A large portion of the farms raise wheat." That "the

farmers raise enough for their own consumption and some to spare." From the most reliable information obtained, it is believed, that the crop of last year, though not so good as that of 1860, cannot be less than two hundred and fifty thousand bushels. No complaint is made of any obstacles to its cultivation in the least formidable, where the soil is sufficiently fertile. Most say, "wheat is as sure as any other grain." "Can raise more bushels of it to the acre on the same land than we can of rye." Smut, rust, blast and insects do not injure it if the general management is correct, and land well cared for.

These facts appear to be unimpeachable, and should stimulate and encourage us to engage more largely in its culture. There is but little variation of opinion respecting the soil best adapted to the growth of wheat. A writer in an agricultural journal in New York, as long ago as 1820, says: "Wheat will grow best on land which contains just as much clay as can be combined with it, without subjecting the wheat to being frozen out; and the point can be ascertained by washing a little of the soil in a tumbler of water, and seeing how long it will take it to become clear. If it takes it more than three hours, it is liable to be injured by frost." Any warm, friable soil, of moderate tenacity, whether it be sandy or gravelly loam, will bear wheat. But a light per cent. of clay with it is preferable. If intended for winter wheat the per cent. of clay should be small, as it increases its liability to winter-killing. Be the soil what it may, the surface should be so undulating, that no water will stand on it during the thaws of winter and spring, or the heavy showers of summer. This is essential to complete success; and also that the soil should be brought to a perfect tilth; be made mellow and permeable to a depth as great as the roots of the plants penetrate, and if the subsoil is hard, and water-bearing, it should be broken up or brought to the surface, that the superabundant water may drain off quickly and without injuring the plants.

The best manure for this crop, and what crop it should succeed, are questions about which there is more doubt. It is the common practice to sow wheat after Indian corn, clover, or tobacco, and as it succeeds well thus, no change is sought or desired. Fine crops have been grown after potatoes. If sown after corn it should be in the spring, as winter wheat on old

land should be sown before corn is ready to harvest, to avoid winter-killing. Nearly all substances, mineral, vegetable, and animal, have been used at various times, with judgment and without, with gain and with loss, as manures and fertilizers for this crop. No one of them all, however, can be recommended as the special manure which under all circumstances and on all soils is particularly adapted to it. It is certain that all strong unfermented animal manures should be always avoided, as they almost invariably produce injury by stimulating the straw to an unnatural, sickly growth, which causes it to fall, producing shrunken berries, and flour of inferior quality.

But all wheat lands should be rich in well-decomposed organic substances, and they may be applied from the yard, the woods, muck-heap or roadside, (and just here, in our opinion, lies the secret of success or failure in wheat growing,) and heavy clay soils will be much improved by dressings of sand. Lime as a special manure for this crop has many advocates. But the farmer who expects to realize large crops on old fields by simply applying a dressing of lime, will most likely meet with disappointment. On clay soils and those rich in vegetable mould, lime is undoubtedly highly beneficial; but it will not supply the place of these substances in the soil, or produce good crops where they are wanting. It is the concurrent testimony of all wheat-growers, that on lands long cultivated, wood ashes are the very best fertilizer for wheat, producing a strong, clean, healthy straw, and well-filled grain. On much worn, sandy soils, heavy dressings of ashes have been known to produce great crops without any other manure. Guano has been long used as a special manure for the wheat fields of Maryland and Virginia. But being too much relied on, as the cheapest, best, and in fact as the only manure, those fields have deteriorated, until the harvest is of little worth. In this State, good success has attended its use, especially on the lighter soils; but it would be unwise to depend on it, to bring our lands into proper condition for wheat bearing, or to preserve their fertility through a course of cropping. The experiment has been tried and found faulty, and we can but be the loser by any attempt of the kind. But if used in connection with those substances that form mould, and give permanent fertility, it may increase our crops and profits.

The varieties of wheat, though undoubtedly springing from a common stock, are almost numberless, and their varying qualities are probably owing to soil, climate, and modes of cultivation. Of the kinds cultivated in this State the principal are, the White Flint, Blue Stem, White Kentucky, Black Sea, Mediterranean, Java, Wisconsin Club, and Bearded Spring; all of which are good, but neither of which can be recommended in all respects as superior to any other. Wheat, like other grains and vegetables, if long cultivated in any locality, is prone to deteriorate in quality and yield, and therefore requires changing. By this a change of variety alone is not intended, but also a change of locality. The Mediterranean of Plymouth County, would be improved by transferring to Berkshire County, and *vice versa*. Each in its new home would produce finely for several years, and then gradually decline, requiring another removal. The various winter varieties are generally preferred by *millers* for flouring. They produce more flour from a given quantity, and it is whiter, but its bread is no sweeter or more nutritious than from spring wheat, and their greater uncertainty on account of winter-killing, leads our *farmers* generally to prefer the spring varieties.

The destruction of wheat, by what is termed winter-killing, may be accomplished in either of three ways: First, by "heating or smothering." The wheat field is sometimes covered deeply with a solid, impervious body of snow, when the earth is not frozen. The active vitality of the roots continues, but all air and light being excluded from the leaves, and consequently all action necessary to preserve the equilibrium of the plant, together with the heat at the surface of the ground, disposing vegetation to decomposition, it is destroyed. The same thing is accomplished, and on the same principle, when vegetation is covered with boards, or stocks of grain or corn. Second, by absolute freezing, in open winters. The ground being bare of snow, and the weather very severe, it becomes frozen to great depth, and very hard. The plant also is exposed to the fierce winter blasts and extreme cold, and not being sufficiently hardy for such treatment, it dies. Third, by the changes of spring, or the freezing and thawing process the soil goes through in the change from winter, to the settled warm weather. The roots of the plant are often drawn from the soil, or broken, and

thus ruined. For the first of these evils, we know of no way of escape or remedy; but experience proves that injury by the two last, if not prevented, is very much ameliorated by sowing early, (on or before the first of September,) and covering the seed deep. The young plants thus become strong and hardy, and the roots well and firmly set in the ground, and it is thus enabled the better to withstand the rigors and changes of the season.

The time of sowing, quantity of seed, and its preparation, have each more or less influence on the crop. The time of sowing the winter variety has been alluded to above, but this is a matter of so much importance, that it is well to call attention to it again, as the reasons for sowing at certain times are good for both the spring and winter varieties. The desideratum in sowing is, if possible, to place the seed in the earth at such a time of the season, that it may be sufficiently late to escape the frosts of May and June, early enough to be out of its bloom and milk, at the time its numerous insect enemies are depositing their eggs, (for it is only when in this state that most of them can do it any injury,) and to be well advanced towards ripening, before the hot, dry weather of late July and early August. In the greater part of the State there is but little danger of the frosts of May and June, therefore sow early as possible. In April, if it can be done, but under no circumstances until the soil is sufficiently dry and warm to work up fine and mellow. In elevated mountainous localities, where the springs are late, and the earth not in condition to receive the seed until after the middle of May, defer sowing until the first or second week in June. Its flowering season will then come after the insects have disappeared, and early September will bring in the grain in perfection.

The quantity of seed per acre should be of the winter variety, one bushel and a half, as the rule; but if sown early, it may be diminished a peck; if late, increased by that amount. The question of the influence of soil of different degrees of fertility on the plants, as affecting their tillering, and consequently the quantity of seed, is of but little practical importance, as the life-long experience of intelligent wheat-growers has led them to adopt nearly this rule. Of spring wheat, two bushels, increased or diminished according to the same circumstances. Should

wheat receive any preparation before sowing? Yes, answers Mr. A, I raise fine crops of wheat, and I invariably soak my seed in strong brine, and roll it in lime, plaster or ashes. But, replies Mr. B, my average crop is twenty-five bushels to the acre, and I neither soak nor roll my seed, lest its germinating power should be destroyed. Here are two undisputable facts. Good crops are grown from both prepared and unprepared seed, and occasionally with each there is a failure.

The diseases of the plant show themselves alike whether the seed be prepared or not. In the growth of the plant, and at the harvest, there is apparently neither gain nor loss by the operation. He that sows, without preparation, does well; and he that prepares his seed does no better. How strongly soever we may cling to supposed natural laws, and theorize on the idea, that by soaking the seed in certain preparations, we are filling it with a fertilizing matter that increases its vital power, and makes it stronger and more prolific, yet the fact is patent, and cannot be impeached, that wheat succeeds equally well if the seed receives no preparation. It is highly important to sow well-developed, healthy seed; therefore, if it is of doubtful character, or is supposed to contain foul seed, there is great benefit in putting it into brine, and taking off every thing that rises to the surface.

Some farmers, influenced apparently by the idea that wheat needs constant nursing and feeding, are accustomed to top-dress their fields, when the plants are young, with some such preparation as lime, plaster, ashes, or guano. Now, while each of these substances may be a good fertilizer for wheat, yet close observation and experience teaches that this mode of application is not economical, and is often injurious. Such substances, by their pungent, acrid properties, are likely to injure to some extent, tender vegetation, if applied directly to its leaves and tissues, and there is great loss of the substances themselves, when left on the surface, exposed to the full action of sun, wind and rain. To receive the full benefit of these fertilizers, they should be applied at the time of sowing, and thoroughly incorporated with the soil.

So far as known, drill-sowing is not practiced in this State. A few farmers cover their seed with a cultivator, or a light horse-plough, but the almost universal practice is, to cover with

the common harrow. Seed sown in this manner, we must admit, "is at the mercy of the harrow, the winds, the birds, the insects, and the clouds." The practice of the best English and Western wheat-growers is, to plant with the drilling machine. The advantages claimed for this method, over broad-cast sowing, are, that time and labor are economized, seed is saved, and a larger yield secured. It is estimated that other things being equal, drill-sown grain will yield one-fifth more than that sown broad-cast. We trust the time is not distant, when the extent of our wheat fields will justify our farmers in the expense of using this instrument of cultivation.

The proper time and manner of harvesting wheat are items of great importance. The general practice is believed to be far from correct. Klippart, an able writer on the wheat plant, makes the following judicious remarks on this topic: "The most judicious millers and grain dealers are decidedly in favor of early harvesting, and certainly their opinion is worth something. In New York, and indeed in all the great grain-growing States, the practice of cutting grain before it is dead ripe, universally prevails. With them, the exact time when it should be cut is no longer a matter of doubt, all being perfectly convinced that the right period is indicated by that change which the grain experiences when passing from a milky state, to that of complete hardness; or, in other words when it is in the dough, and when the kernels without being sticky are not sufficiently hard to resist the pressure of the thumb and finger. The proper maturity for cutting may be judged of more accurately, perhaps, if described as that when the stalk immediately below the head, for two or three inches, becomes yellow and dry, consequently cutting off the circulation—and the grain, though soft and doughy, ceases to yield any milk on pressure. This occurs about a fortnight before the seed becomes dead ripe."

In early harvesting, greater care and attention must of course be given to the curing of the crop. It should be allowed to lay in the swarth but a few hours, especially if the sun be shining clear and warm at the time, but be bound in small bundles, lest the grain should dry too quickly, and immediately place the bundles in stacks, of a circular form, six or eight bundles in a stack, and cover them with a

cap sheaf, or hay caps, where it may be allowed to remain without further labor, until sufficiently cured to take to the barn.

A light, straw-colored worm, resembling in its structure the common wire worm, but much smaller, has infested the wheat fields in some localities, and of which we can find no description by writers on the enemies of the wheat plant. Its ravages are usually committed when the plants are young, and not more than five or six inches in height. The worm burrows in the ground, sometimes cutting off the plants just beneath the surface, and again eats its way into the stalk and up through the centre or beneath the outer leaf, killing every plant it touches, and making the grain too thin and scattering for great crops. Of its nature and habits, length of life or manner of propagation, we know little or nothing, though its works are very manifest. To guard against injury by it, we would suggest the ploughing of those fields in the fall, that are intended for spring wheat. If done immediately before the ground freezes, they might be destroyed by the frost, if in their incipient state, and before they could burrow below its reach, if they are then in maturity.

The past season has witnessed the advent upon our wheat fields, of an insect, identical in every respect, with what is known as the Indian corn plant louse, though that insect is not supposed to prey upon wheat. Its presence has not been noticed in all localities. It causes injury by extracting the juices of the straw and head, while yet quite green, and causing the berries to be less plump and heavy. Whether this insect is to continue its work, and become a pest to our fields, time alone will determine. The past season, early fields almost universally escaped injury from it. And in the future, the early sown may be safe from its depredations. We have thus finished all we deem it desirable to say respecting the modes of wheat culture suitable for our State. We entertain the idea, and have made it sufficiently evident throughout the report, that wheat can, with proper cultivation, be successfully grown here. But the vital point is, will it pay? Of itself, is there any direct profit in it? Can we not make more money by raising other crops, and purchasing our wheat? Leaving out the indirect profit of wheat culture by the increased value of our lands caused by the culti-

vation necessary to produce it, and the social and political independence resulting from producing this article of prime necessity, we will answer these questions by presenting the following table, showing the probable average cost per acre of its cultivation in this State :—

Cost of ploughing, per acre,	$1 50
Harrowing,	75
Seed and sowing,	3 75
Interest on land at $50, and taxes at $1 per hundred,	3 50
Manure,	10 00
Total cost,	$19 50
The average yield is supposed to be twenty bushels per acre, and the average price $1.50 per bushel, making the value of an acre of wheat,	$30 00
Profit on an acre,	$10 50

In this no estimate is made of the value of the straw, or the cost of harvesting the crop. This estimate pays for all the labor, manure, taxes, and twenty-six per cent. on the capital invested in the land.

It cannot be objected to this estimate that the profit of raising wheat should be very much less, in consequence of its liability to failure, because it is a more certain crop than potatoes, equally sure as oats or rye, and nearly so as corn. And besides, an item of much importance which has not been brought into the account is the fact that wheat is the best crop with which to stock down to grass, (unless it be barley.) With the farmer who is pursuing a system of rotation, or whose crop of hay enters largely into his account of profit or loss, this fact is one which under no circumstances should be overlooked. Some writer has said that the cultivation of the wheat plant is the distinctive mark showing that a people have passed from the nomadic into the civilized state. And that in countries where its cultivation has fallen into disuse, there has civilization also retrograded; and were it not for commerce with enlightened and refined nations, they would speedily relapse into all the horrors of absolute barbarism. "Truly," he says, "the wheat

plant is the corner stone of civilization, and its destruction would overwhelm society with darkness blacker than the storm cloud at midnight." We trust the future history of our beloved Commonwealth will in this respect, as in all others, give us a right to the name, and to every blessing of enlightened civilization.

LEVI STOCKBRIDGE,
MOSES STEBBINS,
NATHAN DURFEE,
Committee.

Information having come to the knowledge of the Board that a disease, supposed to be the so-called pleuro-pneumonia, had again broken out in some of the towns in the neighborhood of Boston, a committee was appointed, consisting of Messrs. Peters, Stedman, and Walker, to investigate the facts and draw up a statement of them for the information of the people. At the meeting of the Board held on the 27th of February, the Committee submitted the following

REPORT:

Having good reason to fear that the disease known as pleuro-pneumonia (so fatal in its ravages among the neat stock of North Brookfield and vicinity in the years 1859 and 1860) has again made its appearance in several towns in the county of Norfolk, they feel it to be the duty of this Board to warn the farmers and others, owners of neat stock in the Commonwealth, that the time has arrived for them to take every precaution to prevent the spread of this scourge; and in view of its contagious nature, they would urge the necessity of the greatest care being taken by all interested in purchasing or permitting strange cattle to come in contact with their herds.

The disease now claiming our attention made its appearance in the town of Quincy last April, breaking out in two herds nearly simultaneously. Eight animals from one of the herds were sold to a person in Randolph, in the month of September, for eighty-five dollars for the lot. One of these animals died before reaching the home of the owner, and three more shortly after. The other four have been lost sight of. One herd in

Milton, and also one in Dorchester, have been affected for some months. Four animals from one of these herds, which had been sick during the summer of last year, but had apparently recovered, were taken to Brighton in the fall and sold. Four of the other herd have since died or been killed, all presenting a seriously diseased appearance. On examination by the veterinarians conversant with the Brookfield complaint, they pronounced it identical, so far as they could judge. There are four or five animals still left of this herd, some of which are either sick or showing symptoms of contagion. There are also other cases which have not been examined—the selectmen of the towns waiting the action of the legislature in passing a law authorizing a new commission. The law has now been passed, and the commissioners appointed, and we would respectfully urge upon the gentlemen composing that commission the great importance of immediate measures to investigate the disease, and, if necessary, applying the remedies placed by the law in their hands, that the ravages of this fearful pest, (which there is little doubt is identical with the Brookfield disease, and which can be traced to that neighborhood,) may be stayed.

There still being doubters in the community as to the existence of contagious pleuro-pneumonia, earnest attention is called to the thorough and convincing report of the first Board of Commissioners, with accompanying documents, in the Report of the Secretary of the Board of Agriculture for 1860.

We believe that no person, however prejudiced he may have been, who has been present at the examination of affected animals, has failed to become convinced of the contagiousness of the disease; and it would seem impossible that any one can doubt this fact who will examine the various reports that have been made upon it in Europe and in this country.

H. H. Peters.
Phineas Stedman.
Freeman Walker.

At the same meeting it was

Resolved, That while the State Board of Agriculture recognizes the imperative necessity of a reduction of the expenses of the Commonwealth, at the present time, they also recognize the importance of an efficient agricultural organization throughout the State, consisting of the State

Board and the established agricultural societies. That they look upon such an organization as a most efficient means of stimulating agricultural enterprise, and diffusing agricultural information. And that, at a time, when the National Government is moving in the matter, and other States are renewing their interest in agricultural investigation, Massachusetts should not retrace the steps she has already taken, in the encouragement of this vital branch of human industry.

The delegates appointed to attend and report upon the exhibitions of the various agricultural societies in 1862, were as follows:—

The Middlesex North, Mr. HARTWELL; the Highland, Mr. LOTHROP; the Middlesex South, Mr. STOCKBRIDGE; the Hampden East, Mr. BUSHNELL; the Middlesex, Mr. FISHER; the Hampden, Mr. PHINNEY; the Essex, Mr. STEDMAN; the Worcester North, Mr. BULL; the Berkshire, Mr. WILDER; the Housatonic, Mr. SEWALL; the Franklin, Mr. LORING; the Worcester West, Mr. CLEAVELAND; the Norfolk, Mr. CHAPIN; the Worcester, Mr. WHITE; the Bristol, Mr. WALKER; the Hampshire, Franklin and Hampden, Mr. PETERS; the Worcester South, Mr. STEBBINS; the Plymouth, Mr. MOORE; the Barnstable, Mr. GRENNELL; the Nantucket, Mr. COLT; the Hampshire, Mr. BROOKS; the Martha's Vineyard, Mr. SMITH; the Worcester South-East, Mr. CLEMENT; the Hoosac Valley, Mr. DAVIS.

Voted, That the Secretary of the Board be directed to bring to the notice of the agricultural community, the offer of premiums for the third series of experiments upon manures, and to request its coöperation in increasing the number now making, and that the members of the Board be requested to urge upon the farmers within their districts to compete for the premiums offered.

Select a level piece of land of any convenient size, from twenty rods up to as many acres or more, which should be as nearly equal in its character and conditions as possible. Divide it into five equal parts, numbering them 1, 2, 3, 4 and 5, for a rotation of three years.

Divide the manure which it is proposed to apply, and which should be of a uniform character, into four equal parts. At the time of first ploughing in the spring, spread evenly one-fourth of the manure upon plot No. 1, and then plough the whole field of an equal depth. Apply another fourth part of the manure to plot No. 2, and then cross-plough

the whole field to about half the depth of the ploughing. Spread another fourth of the manure upon plot No. 3, and harrow or cultivate the whole field; after which sow or plant the whole evenly, with any crop preferred. Finally, spread the remaining quarter part of the manure upon plot No. 4.

Observe that by pursuing this course, each of the five lots will receive equally, a deep ploughing, a shallow ploughing, and a harrowing, or cultivating, the only difference in them being that in No. 1 the manure is buried deep, in No. 2 shallow, in No. 3 buried only slightly, but coated with loam, and in No. 4 left exposed upon the surface; while No. 5 gets no manure. The manure is to be spread broadcast and as evenly as possible. The after cultivation should be the same on each of the lots, and the harvest of each should take place at the same time.

Let a statement of the character of the soil, whether light or heavy, dry, or moist, leachy or retentive of manures, the crop of 1861, kind and amount and mode of application of manure in 1861, size of field covered by the experiment, depth of first ploughing, kind and amount of manure used in 1862, kind of crop, when and how sown, number of times and manner cultivated, and weight of product on an average rod of each plot, be made in 1862, and returned in the annual report of each society.

If there is a double product, as grain and straw, corn and stover, let the weight of the secondary product be given on each plot.

If the competitor weigh the whole crop instead of estimating it by an average rod, there will be no objection to such a course.

A brief synopsis of the weather for each of the following months, by dividing each month into three parts, and using the terms dry, moist and wet, to indicate the general character of the weather, will also be expected.

	May.	June.	July.	August.	September.
First Third, . . .	–	–	–	–	–
Middle Third, . . .	–	–	–	–	–
Last Third, . . .	–	–	–	–	–

A similar report of all the above items, except the nature of the soil, will be made in 1863, and in 1864, when the premiums will be awarded. No manure is to be applied to the second and third crop.

STATE CABINET.

Constant effort has been made during the past year to enlarge the collection designed to illustrate the natural history and material resources of the Commonwealth. The interest manifested in it by the increasing number of visitors, from day to day, shows plainly that the cabinet may be made the means of great usefulness and value, especially as a State collection, to which it is confined.

In this connection, Mr. E. A. SAMUELS, who has made the subject a special study, having had charge of this branch of the cabinet, has presented the following paper on the Animals of Massachusetts.

MAMMALIA.

Mammals, or animals which suckle their young, from "mamma," a teat, are divided by naturalists into three great classes, which are called *unguiculata*, animals with claws, *ungulata*, animals with hoofs, and *pinnata*, animals with fins. These classes are divided into orders, which are divided and sub-divided into genera and species, as careful investigation and examination discovers in a number of animals traits or characters essentially different from others closely related, or with some traits or characters common to both.

The great orders or divisions of these primary classes, represented in the terrestrial mammals of this State, are—

I. CHEIROPTERA.—Animals whose anterior fingers are prolonged and connected together, and with the posterior extremities, by a naked membrane, which enables them to fly as the bats, of which this order is composed. These animals are nocturnal in their habits, lying concealed during the day; their food consists almost entirely of insects, (chiefly nocturnal lepidoptera,) which they catch while on the wing. They have three kinds of teeth, incisors, canines and molars; two teats situated on the breast, and bring forth from one to three at a birth, in the summer months. At the approach of winter, they retreat to caves and hollow trees, where they suspend themselves by the hooked nails of their thumbs and feet, and remain torpid until spring.

II. RAPACIA.—Animals which live on animal food, which they usually seize in a violent manner; they are generally provided with strong, sharp claws for this purpose; they have three kinds of teeth, incisors, canines, and molars, have teats placed on the belly, and have a simple stomach.

This order is divided into the sub-orders, *carnivora* and *insectivora*. The carnivora (flesh-devouring animals) subsist almost entirely on animal food, and almost always kill their own prey, as the cats, weasels, &c. The *insectivora* (insect-devouring animals) live on insects, which they usually capture by digging in the ground, as the moles, shrews, &c.

III. RODENTIA.—Animals with generally two large, strong incisors in each jaw, for the purpose of gnawing; hence their name, from *rodo*, to gnaw. They have no canine teeth, there being a space left vacant between the incisors and molars, which are strong, with flat or tuberculated crowns fitted for grinding their food, which is almost entirely vegetable in nature; their teats vary in number, and are placed on the belly; in this order are placed the beavers, squirrels, rats, &c.

IV. RUMINANTIA.—Animals which chew the cud; they have cloven feet, and the male, and often the female, has horns. They have no incisory teeth in the upper jaw, the gum being calloused; their stomach is compound, as in the ox, deer, &c.; it is composed of four different compartments; the food, which is always vegetable in nature, is but little chewed when passed into the first, or largest compartment, (which is called the "paunch,") from this it passes into the second compartment, from which it returns to the mouth, where it is completely masticated, and then passed to the third stomach, from that to the fourth, and thence to the intestines; their teats are usually two in number, and are placed between the thighs.

Order: CHEIROPTERA.

Family: VESPERTILIONIDÆ.—(Bat Family.)

Characteristics.—Fingers of the anterior extremities elongated and connected together, and with the posterior extremities, which are connected together, and with the tail by a semi-transparent and generally naked membrane. This arrangement enables the animals in this family to fly, giving them increased facilities for securing the insects, of which their food consists. They are nocturnal, and in our climate they hibernate. Teats, two in number, placed on the breast.

Genus: *Vespertilio.*—(Linn.)

V. pruinosus, (Say.)—HOARY BAT.

This is one of the least common, and much the largest species found in this State. But little is known of its habits, except that it is less nocturnal than most other species, it being seen occasionally quite early in the afternoon, catching insects, of which it destroys great numbers. Thompson, in his "Quadrupeds of Vermont," speaks of feeding one (which he kept alive) with fresh meat, "of which it eat fearlessly and voraciously."

Description.—Head short and broad; ears broad, naked on the superior margins; incisors, two in the upper jaw and six in the lower; canines large and prominent, two in each jaw; molars, ten in the upper and twelve in the lower jaw; lips and chin black; fur on the body and on the upper side of the (interfemoral) membrane, between the hind legs and tail, black at its base, then yellowish brown, then darker, and terminated with white. This mixture produces a grizzled or hoary appearance, which suggests the name. The fur is of a soft fawn color beneath the neck, and about one-third of the interfemoral membrane, and a strip beneath the wings, about four-fifths of an inch in width, running along the fore-arm to about three-fifths of an inch beyond the wrist, and a spot on the upper side of each elbow and wrist. Length of specimens before me from $3\frac{3}{8}$ to $3\frac{5}{8}$ inches; width from tip to tip of extended wings, 13 to $14\frac{1}{2}$ inches.

V. noveboracensis, (Harlan.)—New York Bat.

This is one of our most common species. At twilight they commence their search for prey, which often continues until daybreak; their appetite being very voracious, they destroy great numbers of insects, of which their food consists. Frequently, several of them may be seen at the same time, busily engaged, and so earnest are they, that they will pursue, for some distance, a stone that may be thrown at them. They often enter through open windows into dwellings, probably in pursuit of house flies. They are readily captured, and will accept insects, or pieces of raw meat.

Description.—Head rather flat, tapering suddenly to the nose; ears broad, naked anteriorly; incisors short, hardly appearing above the gum, two in the upper and six in the lower jaw; canines, two in each jaw, short, extending but little beyond the molars; molars, tuberculated, eight in each jaw; fur on the cheeks and chin, light tawny; on the body and head black at its base, then cream-color, then yellowish red, and terminated generally with white. On the upper side of the interfemoral membrane, the fur is dark-red, and generally without any mixture, and beneath this membrane, for a third its length, and beneath the wings for a strip about half an inch in width, running along the arm and fore-arm to the hand, it is much lighter. The upper side of the wings is entirely naked, with the exception of a spot on each wrist. At the junction of the arm with the body, is a patch of white, which gives this species a distinctive feature, easily recognized. Length of specimens before me varying from 3 to $3\frac{3}{8}$ inches; width across the extended wings, 9 to 11 inches.

V. noctivagans, (Le Conte.)—Silver-haired Bat.

This species is very rarely found in this State, but is more common south, this being probably its extreme northern limit. But very little is known regarding its habits.

Description.—Head broad; ears broad and naked; incisors minute, four in the upper and six in the lower jaw; canines short, scarcely longer than the molars, two in each jaw; molars, ten in each jaw; fur on the body, and on the upper side of the interfemoral membrane black, each hair tipped with white, giving it a beautifully silvered appearance; this furnishes its name. The interfemoral membrane is naked beneath, and the wings naked, except near the body beneath. Length, $2\frac{3}{4}$ inches, width, 8 inches.

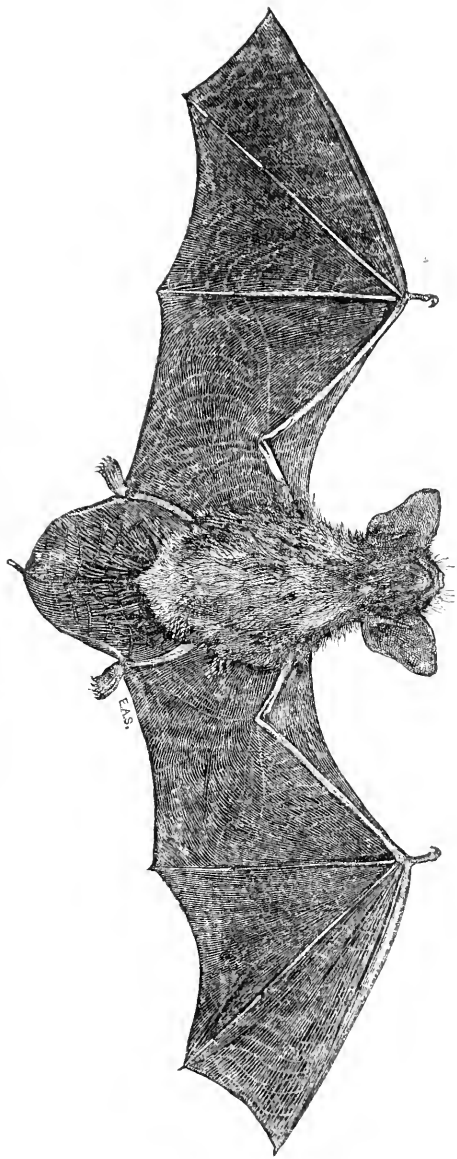
V. *Carolinensis*, (Geoffrey.)—Carolina Bat.—[Fig. 1.]

This is perhaps the most common species found in this State, and, indeed, seems to be distributed very generally over the continent. At sundown these bats commence war on the insects, and often are busy throughout the night. I have often caught them in dwelling-houses, and kept them as pets, feeding them on insects and pieces of meat, which they readily accepted. An individual which I kept several weeks, grew reconciled to confinement, and seemed perfectly at ease. At night he would fly about the room catching house flies, which he eat with a keen relish, the noise he made in crauncliing them could be heard several yards. At daybreak he would retire to a dark corner, sometimes suspending himself by the thumb-claws and feet, but generally by the feet alone, hanging with his head down. On touching him, he would throw his head back, showing his teeth, and uttering, at the same time, a peculiar chattering shriek. This bat had, and I believe all bats have a disagreeable, musky smell.

The young, from one to three, are born in the summer months; the period of gestation is, I believe, unknown. As these animals build no nest, the young are carried about, firmly clinging to the mother till old enough to shift for themselves. I once shot an old female that had a young one clinging at each teat; they were certainly half grown. A number of fine specimens furnish the following description. Head large; ears broad and long, naked, except a third of their posterior base; incisors, four in the upper and six in the lower jaw; canines sharp and powerful, two in each jaw; molars, eight in the upper and ten in the lower jaw; fur brownish, black at its base, terminated on the upper side of the body with brown, and on the under side with gray. The interfemoral membrane is naked, as are also the wings, which are remarkably soft and thin; the last joint of the tail is not included in the interfemoral membrane, but extends little more than an eighth of an inch beyond. Length varying from $3\frac{1}{2}$ to $4\frac{1}{4}$ inches, width from 12 to 13 inches.

V. *subulatus*, (Say.)—Little Brown Bat.

This species can hardly be confounded with any other, unless perhaps the Carolina bat, which it very greatly resembles. This and indeed



Vespertilio Carolinensis.—Carolina Bat.—[Fig. 1.]
(Three-fifths natural size.)

all the bats, are entitled to the protection of the farmer. Multitudes of his worst enemies furnish them food, and perfectly harmless as they are, intruding on no one, it is worse than folly to allow one of them to be killed.

Description.—Corresponding with the Carolina bat, with these exceptions, the *subulatus* has twelve molars in the upper jaw, while the *Carolinensis* has but eight; the last joint of the tail is included in the interfemoral membrane, and the *subulatus* is considerably less than the *Carolinensis.*

Order: RAPACIA. Sub-Order: INSECTIVORA.

Family: SORICIDÆ.—(Shrew Family.)

Characteristics.—Insectivorous, feeding principally on insects and worms, but eating, occasionally, flesh. They have two incisors in each jaw, no canines; six to ten teeth, called false molars, in the upper and four in the lower jaw, and eight molars in the upper and six in the lower jaw. The snout is elongated, flexible, and very sensitive; it is used both in digging and searching for food. The eyes are very minute, and the ears are concealed in the fur. The bodies are cylindrical, and covered with a soft, glossy fur; tail moderate in length, and covered with hair; feet naked beneath, and furnished with five nails; teats varying in number, placed on the belly. These animals are nocturnal, somewhat aquatic, and none of our species hibernate.

Genus: *Sorex.*—(Linn.)

Characteristics.—Head elongated and slender; incisors, two in each jaw; those in the upper curved and notched at the base; those in the lower slanting and elongated; cheek teeth (molars and false molars) eighteen or twenty in the upper, and ten in the lower jaw; eyes minute, but visible; feet with five toes, furnished with nails. These animals have a series of glands along the flanks, which exhale a musky odor.

Sorex Forsteri, (Richardson.)—FORSTER'S SHREW.

These little animals are often met with in this State, both in summer and winter. In the latter season they are often found beneath a pile of wood or logs, and their tracks on the snow show their wanderings in search for food, which are not unsuccessful, as the hairs of some caterpillar

or the wing of a cricket which they sometimes leave, testify. Domestic cats often catch them and bring them home, but seldom eat them, on account of the musky odor which this, as all the other species of this family have. Four specimens before me furnish the following description.

Head long and slender; nose long, and divided at the tip; incisors, two in each jaw; the upper ones curved and notched at the base, the lower ones are slanting, and elongated enough to fit in the notch at the base of the upper incisors, when the mouth is closed.

These teeth are stained red at their tips, as are also the cheek teeth, which are eighteen in the upper, and ten in the lower jaw. The fifth tooth from the incisors in the upper, and the third tooth from the incisors in the lower jaw, are the largest; eyes minute, but visible; ears large, but not quite so long as the fur which conceals them; body slender, largest at the waist, covered with soft, smooth fur, which is dark cinereous at its base, and for two-thirds its length, and tipped on the back with brown, which gradually grows paler to the belly, where it is tipped with grayish ash; whiskers white; feet small, and nearly naked; the fore-arm nearly hid in the fur; three middle toes of each foot much the longest; claws, yellowish white; tail, four-sided, less than the body in length, covered with short, brown hair. Length from nose to root of tail, varying from $2\frac{1}{2}$ to $2\frac{3}{4}$ inches; length of tail from $1\frac{1}{3}$ to $1\frac{2}{3}$ inches.

S. platyrhinus, (Baird.)—Long-nosed Shrew.

This little animal is occasionally seen, and in some localities in the State, is common. It prefers the neighborhood of a swamp to any other, and swims well. With one exception it is the smallest shrew in this State, and I believe on the continent.

Description.—Head long, and very narrow, hardly half as wide as long; the nose is very long, and divided at the tip; whiskers long and black; incisors, two in each jaw, the upper ones curved and notched at the base, to receive the ends of the lower ones; cheek teeth, eighteen in the upper and ten in the lower jaw; all the teeth are tipped with reddish brown; eyes larger than in shrews generally; ears large and longer than the fur that surrounds them; body very slender, covered with rather short hair, cinereous at its base, but tipped on the back with chestnut brown, and on the belly with dark ash; feet rather slender than strong, naked beneath, and whitish; toes provided with slender, white nails; tail cylindrical, covered with short, sparse brown hairs, which are longest at the end of the tail. Length from nose to root of tail, $2\frac{1}{2}$ inches; length of tail, $1\frac{1}{6}$ inches.

S. Cooperi, (Bachman.)—Cooper's Shrew.

This species is found in this State. I have never met with it, and not having a specimen by me, I borrow the description given by Professor

Spencer F. Baird.* This species is "Very slender and small: ears rather large, nearly as long as the adjacent fur; longest hairs on back, about one and a half lines; feet slender, but moderately long; tubercles on sole large and distinct; fore-feet contained nearly twice in the hinder, which are about five-eighths the length of the skull; width of skull rather less than half its length; palate more than three-eighths this length; tail nearly as long as head and body, well pencilled at the tip; third upper premolar tooth above, equal to the fourth; premolars not imbricated; anterior upper incisor, with an inner lobe in contact with its fellow; color above, light chestnut brown, beneath, pale brownish, or chestnut white; length, mostly under two inches; tail, $1\frac{9}{12}$ inches; hind foot, $\frac{46}{100}$ of an inch."

Genus: *Blarina*.—(Gray.)

Characteristics.—Head broad; ear small, completely hidden in the adjacent fur; canines, two in each jaw; false molars, ten in the upper and four in the lower jaw, or eight in the upper and lower jaws; true molars, eight in the upper and six in the lower jaw; body thick and strong; feet large, the anterior ones as broad as the posterior ones; toes, five on each foot, furnished with sharp, curved nails; tail short, nearly as long as the head. This genus includes the short-tailed shrews, of which there are two species in this State.

B. brevicauda, (Gray.)—Short-tailed Shrew.

This species is quite common in some localities in this State. It is not so nocturnal as the other species. I have found them in the day-time busily searching in the fallen leaves and decaying wood for food. Their sense of hearing and that of scent is very acute. I once saw one running along with his nose in the air, like a pointer dog; he went in nearly a straight line for several yards, and soon the crunching of a large beetle, which was plainly audible at the distance of several yards, showed me the game he was after.

Description.—Head large, and about two-thirds as broad as long; incisors, two in each jaw; cheek teeth, eighteen in the upper and ten in the lower jaw; all the teeth tipped with brown; nose naked, bifid, and of a vivid brown color; whiskers long, white; body robust, covered with soft, smooth fur, which is slate-colored at its base, tipped on the back with dark brown, and on the belly with lighter slate; feet nearly naked, the fore-feet quite as wide as the hind feet; inner toe of each foot shortest, outer one next, the three middle ones about of a length; tail short, cylindrical, compressed at the root, clothed with short hairs, which are longest at the tip. Length from nose to root of tail, $3\frac{1}{6}$ inches; length of tail, $\frac{7}{8}$ of an inch.

* Pacific R. R. Survey, Vol. VIII., p. 27.

Blarina talpoides, (Gray.)—MOLE SHREW.

This animal is quite common in this State; it is often seen in summer, at twilight, running through the leaves and grass searching for food, and its tracks in the snow, in the winter, and the little holes it digs through the snow to the ground, with sometimes a fragment of an insect which the little animal has left, attest to its activity in this season when its supply of food must necessarily be small. It prefers the neighborhood of a swamp, and is a good swimmer.

Description.—Head broad; ears concealed in the fur; whiskers numerous, white; body very stout; limbs short and strong; anterior feet wider that the posterior; all the feet naked beneath, with large scales, and scanty, thin hairs above; tail very short, four-sided, covered with short, yellowish-brown hairs, with longer hairs at its tip. Color; the fur on the upper parts is cinereous at its base, tipped with light chestnut; beneath the body, lighter; feet, yellowish white.

DIMENSIONS.

Length of head, 1 inch.
Length of head and body, $3\frac{1}{2}$ inches.
Length of tail, not including hairs at the tip, $\frac{7}{8}$ of an inch.
Length of tail, including hairs at the tip, $1\frac{1}{8}$ inches.
Length of hind-foot, $\frac{5}{8}$ of an inch.
Length of fore-foot, $\frac{1}{2}$ an inch.

Family: TALPIDÆ.—(Mole Family.)

Characteristics.—External ear wanting; no neck; body thick and strong, covered with soft, compact fur; the limbs short; the anterior feet very wide and powerful, and furnished with long, flat claws, fitted for digging. This family is represented in this State by the genera Scalops and Condylura.

Genus: *Scalops.*—(Cuvier.)

Characteristics.—Head long, and tapering to the nose, which is elongated, flexible, and simple; incisors, six in the upper and four in the lower jaw; canines, eight in the upper and six in the lower jaw; molars, six in each jaw; eyes minute, scarcely visible; external ears entirely wanting; neck wanting; body robust, the limbs short, the anterior feet very broad, furnished with long, thin claws; the posterior feet long and slender, furnished with delicate, crooked claws; tail short, slender, and nearly naked.

Scalops aquaticus, (Linnæus.)—COMMON MOLE.

This species is very common in this State, hardly a field or pasture can be met with but has numbers of little loose hills of soil thrown up, which are made by this and the star-nosed mole, in digging for worms

and insects, of which their food entirely consists. This little animal is almost entirely subterranean in its habits, passing most of the time beneath the surface of the ground, where it forms extensive burrows at the depth of three or four inches. The little mounds of loose earth which it throws up, are probably used for breathing places. The neighborhood of a river or pond seems to be a favorite with this species, and it is a good swimmer.

Description.—Head strong, elongated to the nose, which is long, nearly naked, and truncated at the end. The nostrils are placed at the upper side of the end of the snout; incisors, six in the upper and four in the lower jaw; eye very minute, scarcely visible, even on close examination; external ear wanting; body robust, covered with short, thick, smooth fur, which is generally brownish-gray, lighter beneath; fore-feet broad and strong, naked, except near the wrist, scarcely as long as broad, the toes united together by a membrane, to the base of the nails, which are five in number, very long, sharply pointed, thin, and hollowed beneath.

The posterior extremities are weak, the feet long and slender, palmated to the claws, which are thin, curved, and sharp. The tail is short, and nearly naked. Length from nose to root of tail, five inches; length of tail, one inch.

Genus: *Condylura.*—(Illiger.)

Characteristics.—Similar to *scalops*, but with a fringe of radiating cartilages surrounding the nose; tail nearly as long as the body, covered with hair.

Condylura cristata, (Harlan.)—STAR-NOSED MOLE.—[Fig. 3.]

This mole is not uncommon in this State. They are often caught by domestic cats, but seldom eaten by them, on account of the musky odor which this, as well as the common mole has. Like the latter, this species is subterranean in its habits, digging in and beneath the ground for worms and insects, of which its food consists. It prefers the neighborhood of a stream, and is a tolerable swimmer. Four fine specimens before me furnish the following

Description.—Head strong, tapering to the nose, which is surrounded by a number of radiating cartilages, disposed so as to form a star-like fringe, [Fig. 3ª.]—hence the name. Incisors, six in each jaw; canines, long and sharp, six in each jaw; molars, six in each jaw; eyes very minute, hardly visible; body robust, covered with a thick, smooth fur, which is cinereous at its base, and on the back terminated with dark brown, and on the belly with light brown; anterior feet broad, powerful, and palmated to the claws, which are five in number, long, sharply-pointed and thin, and hollowed beneath; the posterior feet are slender, and palmated to the claws, which are five in number, thin and sharp; the tail is about as long as the body

without the head, covered beneath the hairs, which are brown in color, with large scales; it is constricted at the base, and is largest at about a third its length from the body. Length from nose to root of tail, four inches; length of the tail, three inches.

Condylura cristata, (Harlan.)—Star-nosed Mole. [Fig. 3.]
a, Front view of nose.

Sub-Order: CARNIVORA.

Family: Felidæ.—(Cat Family.)

Characteristics.—Head broad and rounded; incisors short, those in the lower jaw forming a regular series, six in each jaw; canines powerful, somewhat curved, two in each jaw; molars, generally eight in the upper and six in the lower jaw, with sharp cutting edges; tongue covered, with sharp prickles pointing backward; anterior feet, five-toed; posterior feet, four-toed; claws long, sharp, curved and *retractile;* teats varying in number, placed on the belly. Animals in this family are generally nocturnal, and entirely carnivorous.

Genus: *Lynx.—(Rafinesque.)*

Characteristics.—Head short, broad and rounded; ears more or less tufted; incisors, six in each jaw; canines, two in each jaw; molars, six in each jaw; body clothed with loose, fine fur; tail short and blunted, scarcely longer than the head.

Lynx rufus, (Rafinesque.)—Bay Lynx, Wild Cat.

This animal is now quite rare in this State—one in several years being about all that are taken. Although very active, and possessed of great muscular power, it is not by any means courageous, but is timid, and even cowardly, almost always flying from man, and in fact from any animal larger than a hare. The following interesting account of the habits of this animal is given by Audubon, in his work on the Quadrupeds of America.

"The wild cat not only makes great havoc among the chickens, turkeys and ducks of the planter, but destroys many of the smaller quadrupeds, as well as partridges, and such other birds as he can surprise roosting on the ground. The hunters often run down the wild cat with packs of fox-hounds. When hard pressed by fast dogs, and in an open country, he ascends a tree with the agility of a squirrel, but the baying of the dogs calling the hunter to the spot, the unerring rifle brings him to the ground, when, if not mortally wounded, he fights fiercely with the pack until killed. He will, however, when pursued by hunters with hounds, frequently elude both dogs and huntsmen, by an exercise of instinct so closely bordering on reason, that we are bewildered in the attempt to separate it from the latter. No sooner does he become aware that the enemy is on his track, than, instead of taking a straight course for the deepest forest, he speeds to one of the largest old fields, overgrown with briary thickets, in the neighborhood; and having reached this tangled maze, he runs in a variety of circles, crossing and re-crossing his path many times, and when he thinks the scent has been diffused sufficiently in different directions by this manœuvre, to puzzle both men and dogs, he creeps slyly forth, and makes for the woods, or for some well-known swamp; and if he should be lucky enough to find a half-dried-up pond, or a part of the swamp on which the clayey bottom is moist and sticky, he seems to know that the adhesive soil covering his feet and legs, so far destroys the *scent*, that although the hounds may be in full cry on reaching the place, and while crossing it, they will lose the track on the opposite side, and perhaps not regain it without some difficulty and delay.

"At other times the 'cat,' when chased by the dogs, gains some tract of burnt wood, where fallen and upright trees are alike blackened and scorched by the fire that has run among them, burning before it every blade of grass, every leaf and shrub, and destroying many of the largest

trees in its furious course. And here the charcoal and ashes on the ground, after he has traversed the burnt district a short distance, and made a few leaps along the trunk of a fallen tree that has been charred in the conflagration, will generally put any hounds at fault. Should no chance of safety be within his reach, he does not despair, but exerting his powers of flight to the utmost, increases his distance from the pursuing pack, and following as intricate and devious a path as possible, after many a weary mile has been run over, he reaches a long-fallen trunk of a tree, on which he may, perchance, at some previous time, have baffled the hunters, as he is now about to do. He leaps on it, and hastily running to the farther end, doubles and returns to the point from which he gained the tree, and after running backward and forward repeatedly on the fallen trunk, he makes a sudden and vigorous spring, leaping as high up into a tree some feet distant, as he can. He then climbs to its highest branches, and, closely squatted, watches the movements of his pursuers. The dogs are soon at fault, for he has already led them through many a crooked path; the hunters are dispirited and weary, and perhaps the density of the woods, or the approach of night, favors him. The huntsmen call off their dogs from the fruitless search, and give up the chase; and shortly afterwards the escaped marauder descends leisurely to the earth, and wanders off in search of food, and to begin a new series of adventures."

The wild cat, in capturing its prey, usually crawls stealthily to within four or five yards, and with a sudden spring seizes it, and retires to the bushes to eat it. His lair is sometimes in a hollow tree that has fallen, sometimes beneath a shelving rock. The female brings forth from two to four young at a birth. A very fine specimen before me that was shot this fall (1861) in the town of Leyden, in this State, furnishes the following

Description.—Head broad and rounded; ears pointed, nearly triangular, superior margins yellowish brown; behind each ear is an irregular-shaped patch of grizzled white, bordered with black; eyes surrounded by a white border, which is broken at the inner angle by a small patch of black; canines, long, powerful, and somewhat curved; whiskers, long and stiff; fur above, and each side of the head yellowish brown at the base, then black, and tipped with yellowish white. There are many irregular waving lines on the top and sides of the head, caused by the fur being terminated with, or entirely black. Beneath the chin and throat the fur is yellowish white, with a patch of brownish black on each side. At the base of the jaw the fur is lengthened into a short ruff; fur above, and on each side of the body, grayish at the base, and about half its length, then yellowish ash, tipped on the sides generally with white, but along the dorsal line with black; beneath the body yellowish white, with scattered brownish black blotches; limbs long, paws large and muscular; fur on the limbs

same color as on the sides of the body, except the upper half of the inside of the limbs, which is yellowish white, with large irregular bars and blotches. There are also some spots of dusky on the outer sides of the limbs; soles of the feet and toes naked; rest of the foot beneath with short, thick, brownish-black fur; tail short and blunted, white beneath and at the tip, with a black patch near the end, and several indistinct transverse bars of brownish-black. Length from nose to root of tail, two feet five inches; length of tail, five inches.

Lynx Canadensis, (Rafinesque.)—CANADA LYNX.

This species—the largest of our American lynxes—is now quite rare in this State. It is strictly a northern animal, being seldom found south of New York. It prefers the solitude of the wilderness to the more settled districts, seldom, like the wild cat, robbing the farmer of his poultry, although occasionally a sheep or lamb is charged to his account by the farmer. It is very powerful and active, making, when pursued, prodigious leaps, but generally, if hard pressed, taking to a tree. It breeds but once a year, having but two at a birth. It is occasionally caught in steel traps, and will readily go in almost any trap, so unsuspicious is it. The fine specimen in the State Cabinet furnishes the following

Description.—Head broad, but not so rounded as the *L. rufus*; ears long, pointed, and terminated with tufts of black hairs an inch and a third long; margins of ears buff; behind each ear is a patch of gray, bordered with black; this patch is much darker than that of the *L. rufus*, and the black border less distinct. Fur above, and each side of the head brindled or mixed, grayish hoary, having irregular waving lines of brownish-black on the top of the head; beneath the chin the fur is white, and at the base of the jaws the fur is lengthened into a long ruff at each side; this ruff is composed of three colors, black, white, and grayish drab. Fur on the body and outer sides of the legs, pale rufous at its base, terminated with black and white, which gives it a hoary appearance; beneath the body this is lighter, with a number of distinct black blotches on the back, the black hairs predominate in several distinct lines, especially towards the rump; limbs long, the fore-paws very wide, the posterior ones exceedingly long, the specimen before me measuring ten inches; on the outer sides of the legs there are many obscure blotches; between the legs the fur is buff, with a few obscure blotches on the posterior, and several distinct black spots on the anterior legs; feet, beneath clothed with dense, buff, hairy fur; tail, beneath white, above and on each side grayish rufous; end of the tail for an inch and a half in length, black. Length from nose to root of tail, two feet eleven inches; length of tail, six inches.

Family: CANIDÆ.—(Dog Family.)

Characteristics.—Head lengthened, sharpened to the muzzle; ears pointed, and generally erect; incisors, six in each jaw; canines, two in each jaw, powerful, somewhat curved; molars, generally twelve in the upper and fourteen in the lower jaw, with edges adapted to cutting flesh, of which the food of the animals in this family almost wholly consists; *tongue without the prickles*, which the felidæ have; body contracted at the belly, generally clothed with long, hairy fur; anterior and posterior feet four-toed, the former with a rudimentary thumb, which has generally a claw above the foot; claws of each foot *not retractile*, as with the felidæ; tail long and bushy; teats varying in number, placed on the belly; young, from two to six at a birth.

Genus: *Vulpes.*—(Cuvier.)

Characteristics.—Head slender, and pointed to the nose; eyes oblique; body clothed with soft fur, with long hairs mixed with and extending beyond the fur; tail (called the bush,) long, covered with long, soft fur, and hair intermixed; animals in this genus have a fetid odor, are partly or generally nocturnal in their habits, and have from three to six at a birth, (in April, in this State.)

Vulpes fulvus, (Richardson.)—COMMON AMERICAN FOX.

This species is still common in this State, particularly in the forests of the western and northern part. I have shot a number within seven miles of Boston, within three years, and have known of some being killed this fall, (1861,) in Norfolk County.

The general character and habits of this animal are so well known that a description of them is hardly needed here; his cunning is so great that it has passed into a proverb, trapping him being almost impossible. At the breeding season, and while the young are provided for by the old ones, the cunning in a great measure gives place to the desire to furnish an abundant supply of food for the young. In the summer (June) of 1858, near the house in which I was residing, in Dorchester, a pair of foxes had burrowed and had a litter of four young; the burrow was on the south side of a low hill, in a thicket of whortleberry bushes. There would have been some sagacity in the choice of a neighborhood (this locality being surrounded by a number of farms, each with a nice flock of poultry) were it not for the fact, that the little patch of bushes and shrubs where they had chosen their home, was scarcely an acre in extent, and of course more or less familiar to every boy in the neighborhood. Presently, several hens were missing from one flock, and others missing from neighboring flocks, led to inquiries which resulted in the discovery of the fact that a fox had been seen

running across the fields to this thicket. Search was made, and the home of Reynard found. The burrow extending beneath a ledge of rocks, no attempt was made to dig them out, it being determined to lie in wait and shoot them at the first opportunity. Accordingly, one day I took my gun, and hiding myself behind an old stone wall, less than a gun-shot from the mouth of the burrow, awaited events. Shortly, I heard a rustling in the bushes, and looking, saw the old one coming up the hill with a nice large domestic duck in her mouth. I waited till she got near the burrow, when I fired, one barrel loaded with swan shot; she did not drop dead, but ran limping across the fields to some woods, where she was subsequently found dead. I loaded up and waited patiently for her to return, but she did not. I was about giving it up for that day, when suddenly there ran out a young fox presently followed by three others; they were about of a size, and were about half grown; they were very playful, rolling on the ground and over each other like kittens or puppies. I watched them for a while, and shot them, killing two with each barrel. They were much grayer than the old one, and the fur lacked the hairs which in the old animal extended beyond the fur.

The food of the fox consists of hares, rats, squirrels, and birds; he is a great nuisance to farmers, on account of his love for poultry. Several fine specimens furnish the following

Description.—Head long, sharpened to the nose; ears large and pointed, with fur on the exterior and interior, the latter the longest and coarsest; color of fur behind the ear, brownish black; fur on the body above and on each side, yellowish red, darkest on the anterior half of the body; in this fur are thickly scattered hairs which extend beyond the fur; these hairs are darker than the fur; chin and belly white; fur beneath the body deepening into yellowish white as it extends to the yellowish red of the sides; breast yellowish gray; limbs pretty long and strong, their anterior sides brownish black; feet brownish black, with naked spots beneath the soles and toes; tail very bushy, largest near the end, lighter colored than the body; tip of the tail white. Length from nose to root of tail, from two feet two inches to two feet five inches; length of tail, sixteen to seventeen inches.

Family: MUSTELIDÆ.—(Weasel Family.)

Characteristics.—Head (generally) long and pointed to the nose; ears short and rounded; incisors, six in each jaw; canines, two in each jaw; pre-molars, six or eight in each jaw; true molars, tuberculated, two in the upper and two or four in the lower jaw; body (generally) long and slender; legs short; feet, five-toed, provided with long, sharp

[PLATE I.]

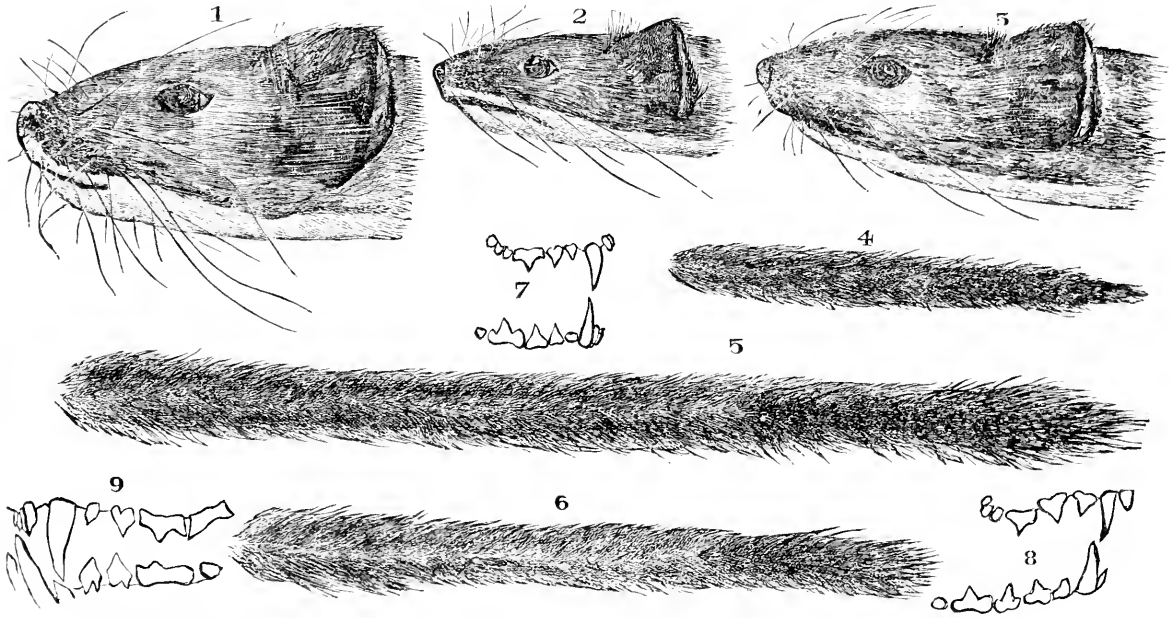


Fig. 1.—Head of *Putorius noveboracensis.*
2.—Head of " *pusillus.*
3.—Head of " *Richardsonii.*
5.—Tail of " "
7.—Teeth of " "

Fig. 4.—Tail of *Putorius pusillus.*
6.—Tail of " *cicognanii.*
8.—Teeth of " *visou.*
9.—Teeth of *Mephitis mephitica.*

claws; tail long, sometimes bushy, (as in *mephitis.*) Animals in this family have generally glands at the roots of their tails, which have a secretion, in some cases of the most intensely disagreeable odor, as the skunks, who use this secretion as a defensive weapon.

Genus: *Putorius.*—(Cuvier.)

Characteristics.—Head oval, and tapering to the muzzle, which is blunted; incisors, six in each jaw; canines, two in each jaw; pre-molars, six in each jaw; true molars, tuberculated, two in the upper and four in the lower jaw. Limbs short, feet small, toes connected at their bases by a membrane; tail long and cylindrical, covered with hair.

Putorius pusillus, (Aud. and Bach.)—Least Weasel. [Pl. I., figs. 2 and 4.]

This animal is the smallest of our weasels, and indeed of the North American carnivora. Although not uncommon in this State, it is seldom taken, its small size and great activity rendering its capture extremely difficult. Its exceedingly slender, flexible body is particularly adapted to following through crevices, sometimes very small, the mice and rats, which constitute the greater part of its food. Having a very voracious appetite, the great number of these animals that it destroys would justly entitle it to the protection of the farmer, if its operations were confined to these pests, but, unfortunately, this is not the case, it having a weakness for birds, eggs, and chickens.

Two fine specimens belonging to the State Cabinet, furnish the following

Description.—Head long, flattened above, tapering to the nose; ears short, slightly pointed; neck long; body very slender; limbs short, feet hairy; the soles and ends of the toes beneath, naked: tail rather short and slender; fur of the upper two-thirds of the head, neck and body, outsides of the legs to the toes, and tail, light brown; the upper lip, and beneath the chin, throat and body, and between the anterior legs to the wrist, and the posterior legs to the ankle, white. Length of head, 1½ inches; greatest width of the head, ⅝ of an inch; length from nose to root of tail, seven inches; length of tail, not including the hairs at the tip, 1¼ inches; including the hairs, 2⅜ inches; length of the hind foot, 1⅜ inch.

P. cicognanii, (Baird.)—Small Brown Weasel. [Pl. I., fig. 6.]

This species is quite common in this State. The same remarks may apply to this as to the preceding, regarding the habits, &c.; but unlike the *P. pusillus*, the fur of this species changes in winter to a clear white, with the exception of the tip of the tail. This change, I am almost

certain, does not occur with the former, as I have shot numbers in summer and winter, and could see no difference, except, perhaps, that the brown was a *trifle* lighter in winter. A number of specimens before me in the summer and winter pelage furnish the following

Description.—Head rather broader than the *P. pusillus;* ears broad and rounded; neck short, and body more robust than the *P. pusillus;* limbs short; feet rather wide, densely clothed with hairs, which almost conceal the naked pads beneath the soles and toes; tail long, its tip and one-third its length, black; fur of the upper part of the head, neck, body and sides, outside the legs to the toes, and two-thirds the length of the tail from the root, in summer, brown, a shade darker than the *P. pusillus;* edge of the upper lip, and beneath the chin, throat and body, and lower part of the sides, and between the anterior limbs to the wrist, and between the posterior limbs to the ankle, white, with a yellowish tint. In winter the whole fur, with the exception of the tip of the tail, is pure white, with sometimes a yellowish tint. Length of head varying from $1\frac{3}{8}$ inches to $1\frac{5}{8}$ inches; greatest width of head, 1 inch to $1\frac{1}{8}$ inches; length of body from nose to root of tail, $7\frac{7}{8}$ to $8\frac{1}{8}$ inches; length of tail, not including the hairs at the tip, $2\frac{7}{8}$ to 3 inches; including the hairs, $3\frac{7}{8}$ to $4\frac{1}{8}$ inches; length of hind foot, $1\frac{5}{8}$ inches.

P. Richardsonii, (Richardson.) [Pl. I., figs. 3, 5 and 7.]

This species occurs in this State, how frequently I am unable to say; but should pronounce it rare. I have not been able to collect more than two specimens, (in summer dress); but this may be owing, not so much to their scarcity as to my not finding their most favorable localities. There seems to be great confusion in regard to the identity of this species. Richardson first described it (I believe) with the above name. Audubon claimed it as his discovery, and named it *P. agilis*. The confusion which exists regarding this species, is unfortunately not confined to it, but seems to extend to the others.

I do not intend to add to it by any conjectures or suggestions, but give a description of two specimens before me, which were killed in this State, and which are probably of this species.

Description.—Head long and slender; ears rather long, wide, and slightly pointed; neck and body slender; limbs rather longer than the preceding, and the feet smaller; tail very long, the tip and nearly half its length black; color of the fur (in summer) on the upper part of the head, neck and body, outside of the legs and the tail to the black tip, reddish-brown; beneath the chin, throat, and between the anterior legs, to a little below the elbow, and between the posterior legs, to just above the knee, yellowish-white. In winter the whole fur is white, with the exception of the tip of the tail, which is black. Length of head, $1\frac{5}{8}$ to

1⅞ inches; width, ⅞ of an inch; length from nose to root of tail, 7⅞ to 8½ inches; length of tail, not including the hairs at the tip, 4 inches; including the hairs, 5⅛ to 5⅜ inches; length of the hind foot, 1 to 1⅛ inches.

P. noveboracensis, (De Kay.)—Ermine, Common Weasel. [Pl. I., fig. 1.]

This species is probably the most common we have; it is literally the "Common Weasel." Its habits are about the same as those of the other species; having the activity of the others, together with greater strength, its powers of destruction are much greater, as many a poultry-man can bear witness to; its courage is also great. I have often seen it face a dog, and even give him battle. It has an enemy in every sportsman, because of its bad habit of stealing on a roosting covey of quails, or a brood of partridges or woodcocks, and slaughtering every one possible; it often enters the burrow of the rabbit, and generally makes a clean sweep of old and young. In seizing its prey, it throws its little body over and around it, usually biting it at the junction of the head and spine, or through the skull into the brain. An instance that fell under my notice will go to show the destructive propensities of this animal. A farmer living in Dorchester had a fine flock of nineteen fowls; the hen-house was built on a side of a hill, the back being dug into the hill, and walled up; this was a mistake—no hen-house should have any stone wall of any kind about it, it but affords comfortable homes for rats and other vermin, and has no recommendation, not even that of economy. It was his habit at sundown, or a little later, to close a small door in the side of the hennery, to keep out vermin. One evening, about an hour and a half after he closed the hen-house, a hen was heard squalling, and on going to the hennery to find out the cause, every hen in the lot was found dead, each with a bloody spot at the nape of the neck, or a little wound just over the eye. Search was made for the assassin, but the artful little villain was safe behind the stone wall. The hens were removed, a steel trap, baited with one of their heads set, and the scamp was found the next morning caught by one of his feet; he was kept several weeks in a box, but could not be tamed; he eat greedily of birds, mice and raw meat, but pined and died of confinement.

The nature of this animal is eminently blood-thirsty; it will continue killing as long as it has any thing to kill; although its appetite might have been satisfied abundantly with the first hen in the above instance, its instinct prompted it to kill the whole. The great number of rats and mice which it destroys, entitle it to some consideration, but the fact that it visits the poultry-yard "with unlawful intent," is enough for the farmer, who pursues him to the bitter end. The tracks of this animal in the snow are easily recognized, his run (a succession of leaps) causing

him to bring his hind feet into the tracks made by the fore-feet, thus giving a series of pairs of foot prints, about nine or ten inches apart.

The nest of this animal is usually in a stone heap, or beneath a rock, or in a ground-squirrel's burrow; the young are from three to seven in number, and are born in May, in this State. Like the other species, it is generally nocturnal in its habits, and has an extremely disagreeable odor. A number of fine specimens in the summer and winter dress and change, furnish the following

Description.—Head thick; muzzle blunted; ears short and rounded; body slender; limbs longer than with the preceding; feet large, the anterior as wide, but not so long as the posterior, clothed with hair; soles and bottoms of the toes naked; tail long, cylindrical, black for one-third its length at the end. Summer dress—head and body above and on the sides and outside the legs to the toes and the basal two-thirds of the tail, chestnut-brown; upper lip, and beneath the head, neck and body, and between the fore legs to the toes, and between the hind legs to the ankles, white. Winter dress—entirely white, with a yellowish tint; the tip of the tail black, as in the summer dress. Length of head, $2\frac{1}{8}$ inches; length of head and body, 9 to $10\frac{1}{2}$ inches; length of tail, not including hairs, 5 to $5\frac{1}{2}$ inches; including hairs, $6\frac{1}{2}$ to 7 inches; length of hind foot $1\frac{5}{8}$ to $1\frac{7}{8}$ inches.

P. vison, (Gapper.)—Common Mink. [Pl. I., fig. 8.]

This species is common in this State; the value of its fur is sufficient to cause it to be hunted and trapped to such an extent, that its numbers are fast diminishing. It prefers the neighborhood of a stream or pond, and swims well. Its great activity and strength permits it to conquer animals much its superior in size, often killing the rabit and hare. I have known it to drive off a cur dog when attacked by him. Like the other weasels, it destroys great numbers of rats and mice, and often visits the poultry-yard, where its destructive inclinations are allowed full play, the death of the last fowl only satisfying it.

The following interesting account of its habits is given by Audubon, in his own happy style: "Next to the ermine, the mink is the most active and destructive depredator that prowls around the farm-yard, or the farmer's duck-pond, where the presence of one or two of these animals will soon be made known by the sudden disappearance of sundry young ducks and chickens. The vigilant farmer may perhaps see a fine fowl moving in a singular and most involuntary manner, in the clutches of a mink, towards a fissure in a rock, or a hole in some pile of stones, in the gray of the morning, and should he rush to the spot to ascertain the fate of the unfortunate bird, he will see it suddenly twitched into a hole too deep for him to fathom, and wish he had carried with him his double-

barrelled gun, to have ended at once the life of the voracious destroyer of his carefully tended poultry. Our friend, the farmer, is not, however, disposed to allow the mink to carry on the sport long, and therefore straightway repairs to the house for his gun, and if it be loaded and ready for use, (as it always should be in every well-regulated farm-house,) he speedily returns with it to watch for the re-appearance of the mink, and shoot him ere he has the opportunity to depopulate his poultry-yard. The farmer now takes a stand, facing the retreat into which the mink has carried his property, and waits patiently until it may please him to show his head again. This, however, the cunning rogue will not always accommodate him by doing, and he may lose much time to no purpose. Let us introduce you to a scene on our own little place, near New York.

"There is a small brook, fed by several springs of pure water, which we have caused to be stopped by a stone dam, to make a pond for ducks in the summer, and ice in the winter; above the pond is a rough bank of stones through which the water filters into the pond. There is a little space near this where the sand and gravel have formed a diminutive beach. The ducks descending to the water are compelled to pass near this stony bank. Here a mink had fixed his quarters, with certainly a degree of judgment and audacity worthy of high praise, for no settlement could be more to his mind. At early dawn the crowing of several fine cocks, the cackling of many hens and chickens, and the paddling, splashing, and quacking of a hundred old and young ducks, would please his ears; and by stealing to the edge of the bank of stones, with his body nearly concealed between two large pieces of broken granite, he could look around and see the unsuspecting ducks within a yard or two of his lurking place. When thus on the look out, dodging his head backward and forward, he waits until one of them has approached close to him, and then with a rush, seizes the bird by the neck, and in a moment disappears with it between the rocks. He has not, however, escaped unobserved, and like other rogues, deserves to be punished for having taken what did not belong to him. We draw near the spot, gun in hand, and after waiting some time in vain for the appearance of the mink, we cause some young ducks to be gently driven down to the pond—diving for worms or food of various kinds, while danger so imminent is near them—intent only on the objects they are pursuing, they turn not a glance toward the dark crevice where we can now see the bright eyes of the mink as he lies concealed. The unsuspecting birds remind us of some of the young folks in that large pond we call the world, where, alas! they may be in greater danger than our poor ducks or chickens. Now we see a fine hen descend to the water; cautiously she steps on to the sandy margin, and dipping her bill in the clear stream, sips a few drops and raises her head as if in gratitude to

the Giver of all good; she continues sipping and advancing gradually; she has now approached the fated rocks, when with a sudden rush the mink has seized her; ere he can regain his hole, however, our gun's sharp crack is heard and the marauder lies dead before us." . . .

"This species prefers taking up its residence on the borders of ponds and along the banks of small streams, rather than along large and broad rivers. It delights in frequenting the foot of rapids and waterfalls. When pursued it flies for shelter to the water, an element suited to its amphibious habits, or to some retreat beneath the banks of the stream. It runs tolerably well on high ground, and we have found it on several occasions no easy matter to overtake it, and when overtaken, we have learned to our cost that it was rather a troublesome customer about our legs and feet, where its sharp canine teeth made some uncomfortable indentations; neither was its odor as pleasant as we could have desired. It is generally supposed that the mink never resorts to a tree to avoid pursuit; we have, however, witnessed one instance to the contrary. In hunting for ruffed grouse (*T. umbellus*,) we observed a little dog that accompanied us, barking at the stem of a young tree, and on looking up, perceived a mink seated in the first fork, about twelve feet from the ground."

The nests are made in piles of stones, beneath rocks, and in burrows, usually rabbit burrows. The young are from three to seven in number, and are born in this State in the month of May.

Description.—Head small and slender; ears broad, short and round; neck long; body long and slender; legs short and stout; feet large, covered with hair above and beneath, except the naked pads on the soles and toes; the toes semi-palmated; fur soft and dense, with long and stiff hairs in it, and extending beyond it; color on the whole body, with the exception of the chin beneath, and a spot on the throat beneath, which is white, dark brown; the same above and below; tail long. Length of head, 3⅛ inches; length of head and body, 16½ inches; length of tail, not including the hairs at the tip, 6½ inches, including the hairs, 8 inches; length of hind foot, 2¼ inches.

Genus: *Lutra.*—(Linn.)

Characteristics.—Head large and flattened; ears short and rounded; incisors, six in each jaw; canines, much curved and sharpened, two in each jaw; false molars, eight in the upper, and six in the lower jaw; molars, two in the upper, and four in the lower jaw; the upper posterior ones large and quadrate. Body long, slender, and covered with stiff, glossy fur, with a softer fur intermixed; legs short and strong; toes, five on each foot, palmated and provided with short, strong claws; tail tapering

and flattened horizontally, with two glands at its base, secreting a fetid liquid.

Lutra Canadensis, (Sabine.)—CANADA OTTER, AMERICAN OTTER.

This species, once quite common in this State, is now nearly exterminated, one in two or three years being about the greatest number captured. It takes up its residence in the bank of a river or pond, and is careful to have a passage leading to and beneath the water. It is an expert swimmer and diver, catching with ease the fishes, of which its food principally consists, and of which it destroys great numbers. It is a very active, strong animal, although rather clumsy on the land, its habits being almost entirely aquatic. When attacked by a dog, it often proves more than a match for him, its sharp, strong teeth inflicting an ugly bite, and its tough skin and thick fur affording it protection from the attacks of its assailant. It is a very cunning animal, trapping it being generally unsuccessful, unless the trap is set beneath the water, at the mouth of its burrow, or at the foot of its slides. A strange peculiarity this animal has, is its habit of climbing to the top of a steep bank or snow drift, and sliding on its belly head foremost to the bottom; this operation is repeated sometimes forty or fifty times, and seems to afford it great amusement. If caught young, it is easily tamed, feeding greedily on fishes, fresh water clams and frogs. It breeds once a year, (in March, in this latitude,) and has from one to three at a birth. I am informed that there has been several seen this season in Marlborough, in this State, in what is called "Ram's Horn Brook;" its banks are miry, and difficult of access. A fine specimen killed in Palmer, in this State, furnishes the following

Description.—Head long, somewhat oval; ears very short and rounded, with hairs within and without; nose blunt; body very long, slender, and nearly cylindrical; limbs very short and strong; feet broad; soles and bottoms of toes naked; toes webbed; claws short and strong; tail long flattened horizontally, and tapering, slightly constricted at its base. Length of head, 6 inches; width of head, 3⅞ inches; length of head and body, 30 inches; length of tail, not including hairs at the tip, 15 inches, including the hairs, 16 inches; length of fore-foot, 2½ inches, hind foot, 3½ inches.

Genus: *Mephitis.*—(Cuvier.)

Characteristics.—Head small, and pointed to the nose, which is naked, and somewhat projecting; ears short and rounded; incisors, six in each jaw; canines, two in each jaw; false molars, six in each jaw; molars, two in the upper and four in the lower jaw; body, rather slender than robust, clothed with long, soft fur, and hair growing beyond; limbs short; feet short, strong and fossorial; soles usually naked; feet five-toed, each toe provided with a long, sharp, crooked claw, those on the anterior feet

much the longest; tail long and bushy, two glands near the anus secrete a disgustingly fetid liquid, which is used as a means of defence. Animals in this genus are almost entirely nocturnal in habits, and their food is animal in nature.

Mephitis mephitica, (Shaw.)—SKUNK.

This animal is, unfortunately, quite common in this State. Its thoroughly wicked character and peculiar weapon of defence have rendered it universally detested, its destruction being regarded as meriting the highest approbation. Its only recommendation is, that it destroys quantities of insects, both in the larva and perfect state. Its habits are almost entirely nocturnal, although it is often seen in the daytime especially in spring. Unless provided with a gun, it is always best to give it a wide berth, an encounter in any other case resulting in a total and inglorious defeat. On coming suddenly on it, it immediately faces you, with its tail erect, or lying flat along the back, its little black eyes sparkling maliciously. Woe to you unless you stand perfectly still, until it walks leisurely away; the least movement of yours being surely purchased by an ejection, often in your face and eyes,—its aim being very accurate,—of a liquid with a most intensely and disgustingly nauseating odor, which, if it reaches the eye, produces an inflammation and partial blindness, and causes the skin to become inflamed and vesiculated. The glands in which this liquid is secreted are situated near the anus; they are very muscular, capable by contraction, of throwing the liquid twelve or fourteen feet. This liquid is of a yellowish color, is very acrid, and at night is luminous. The skunk, when ejecting it, lays its tail flat on its back, throwing little jets of a few drops at a time, with great precision.

Dogs share in the universal hatred for this animal, and will always attack it, even if their experience warns them what to expect. A young pointer with which I was once shooting, came to a point at a little bunch of bushes, which I could not make him enter. Supposing that there might be a covey of quails or partridges lying close, I entered cautiously, hoping to get a double shot. In the interior of the bushes was a little patch of grass, perhaps three or four rods in area, where a skunk, its tail erect stood ready to give me a warm welcome; of course I stopped and naturally stepped back, just as one would if he saw a rattlesnake across his path. My dog being at my heels brushed rather quickly by me, and before I could stop him, entered the space where stood the skunk, his wicked little black eyes twinkling in anger. They stood facing each other for a moment, when the dog, not knowing the nature of the job he was undertaking, made a rush at the skunk who met him with a volley in the face and eyes that sent him rolling on the ground, yelling and digging his head in the earth and acting as if mad with

pain. I shot the skunk and took the dog to a pond near by, in which he rushed, trying to wash the venom out of his eyes. I let him stay as long as he wanted to, but for a week after his eyes were inflamed, and nearly blind. The odor remained on him over a month. The skunk is a great plague to the farmer, often doing considerable damage in the poultry yard. In seizing its prey it throws itself over and around it, like the weasels, usually biting it at the nape of the neck, or through the skull into the brain.

In a lot of eleven fowels that I examined, which were killed by a skunk in one night, I found none of them bitten any where except on the head, in some cases the head was eaten off entirely.

It often trails animals like a dog, and though clumsy and slow in its movements, will perseveringly follow the object of its pursuit until it has driven it to its burrow, where following it in, the whole family is sacrificed to its rapacity; such is often the case with the common rabbit. (*Lepus sylvaticus.*)

The skunk breeds but once in a year, and has from three to seven at a birth. In early winter it retires to its burrow, which is usually in or beneath a ledge of rocks, where it remains sleeping until early in the spring. It is quite poor when it comes forth from its winter sleep.

Description.—Head small and pointed; ears small; eyes small, black and piercing; body rather slim, although the long fur gives it a robust appearance; limbs short; feet strong, the anterior ones provided with long slightly curved claws decidedly fossorial, or adapted to digging; soles of the feet and toes, which are webbed, naked; tail long and bushy; color of the head, body, limbs and tail, black, with the exception of a narrow stripe of white running along the top of the head, about an inch and a quarter long, a patch of white commencing at the nape of the neck, running back to between the shoulders, where it separates in the form of the letter V, the diverging points extending about half the length of the body; and the end of the tail, which is white, and slightly tufted. These white markings vary considerably, no two specimens being exactly alike. Length of head, 2½ inches, width, 1¾ inches: length of head and body, 17 inches; length of tail, not including the hairs at the tip, 9 inches, including the hairs, 13½ inches; length of hind foot, 2¼ inches.

Family: URSIDÆ.—(Bear Family.)

Characteristics.—Incisors, six in each jaw; canines, two in each jaw; pre-molars, eight in each jaw; molars, tuberculated, four in the upper and generally six in the lower jaw; nose somewhat elongated and movable; body strong; limbs strong; feet five toed; walk plantigrade; toes dis-

tinctly separated; soles of the feet naked; food omnivorous. Some species hibernate.

Genus: *Procyon.*—(Storr.)

Characteristics.—Head broad and rounded, tapering rapidly to the nose, which is truncate, somewhat elongated and movable; ears short, erect; incisors, six in each jaw; canines, two in each jaw; false molars, eight in each jaw; molars, four in the upper and four in the lower jaw: body rather stout; limbs strong; feet five toed, walk less plantigrade than the other genera of the family Ursidæ; tail moderately long; food omnivorous.

Procyon lotor, (Storr.)—Raccoon.

This animal is not uncommon in this State, particularly in the western and northern counties. It is a restless, mischievous animal, nocturnal in habits. Its food is miscellaneous in character, consisting of animals, birds, fishes, reptiles, shell-fish, insects, fruit, vegetables and grain, particularly Indian corn when in the milk stage: in fact, its incursions into the corn-fields have rendered it an object of dislike to the farmer, who loses no opportunity of destroying it. It has a propensity of destroying much more than it can eat; to which its visits to the corn-fields, where it breaks down the corn-stalks in every direction,—to the poultry yard, where it destroys every fowl it can reach, eating the head and leaving the mutilated body,—and to the apple and peach orchard, where it selects the finest and most luscious fruit, but only taking a bite or two of each before turning to another, give tangible evidence. It is very fond of eggs, and is not particular to have them fresh laid; being an excellent climber, no bird's nest is secure from it, and the number which it destroys is not inconsiderable.

It is a very cunning animal, but is easily trapped, entering readily a trap baited with a fish or ear of sweet corn; the most common trap with which it is taken is a heavy log set with a figure of 4 trigger, which when sprung drops the log on the raccoon, who is crushed to death; if caught when young it is easily tamed, but makes a mischievous pet.

It makes its nest in a hollow tree, and has from three to seven at a birth, in May, in this State. It prefers the neighborhood of a thick swamp with large trees scattered through it, and with a stream of water running through it.

The raccoon hibernates through the winter.

Description.—Head short and rounded, tapering suddenly to the nose, which is naked, sharpened, and somewhat movable; ears short, rounded at the tip, covered with hair on both sides; whiskers white, few in

number, very stiff, like bristles; neck short; body robust; limbs rather short; feet naked beneath; toes provided with strong curved, sharp claws; tail moderately long and bushy; fur, two kinds, a very soft fine fur with a coarser fur growing in and beyond it; color of head, neck, body and legs, yellowish gray; the hairs on the back and upper parts of the sides, tipped with black. There is a patch of brownish black running from the nose to between the eyes, where it separates into two patches, one running on each side of the face to the neck; the tail is yellowish gray and has usually five black rings which encircle it, except a short distance beneath; the tip of the tail is black; the under fur on the body is dingy brown.

DIMENSIONS.

Length of head, 5½ inches.
Length of head and body, 23 inches.
Length of tail, not including the hairs at the tip, 9½ inches.
Length of tail, including the hairs at the tip, 11 inches.
Length of hind foot from heel to tip of claw, 4 inches.
Length of fore foot from heel to tip of claw, 2½ inches.

Genus: *Ursus*.—(Linn.)

Characteristics.—Head large; ears large, tapering and pointed; teeth as in the genus *Procyon*, with the exception of the molars, which are four in the upper, and six in the lower jaw; body stout, covered with long thick hair; limbs strong; toes entirely separated, furnished with strong curved claws fitted for digging; tail short. Animals in this genus are almost entirely nocturnal in their habits; they are omnivorous, and generally hibernate.

Ursus Americanus, (Pallas.)—Black Bear.

This animal, once common in this State, is now very rare. I am informed that several have been seen in the towns of North Adams, Florida, and Clarksburg, during the past year, but probably this species will very soon be entirely extinct with us. It is not a ferocious animal, always retiring before man, unless in defence of its cubs; it is not so carnivorous as some of the other species, its favorite food consisting of fruits, vegetables, berries, nuts (mast) and grain. Like the raccoon, this animal is very fond of corn while it is in the milk, and does great damage when visiting the corn-fields, by breaking down and destroying much more than it eats. It often destroys young cattle, sheep and hogs, but seldom, unless impelled by hunger. It is often taken in steel traps, which, instead of being firmly fixed at one spot, are fastened to a log which is not so heavy but the bear can drag it; this is called a hobble; it effectually does what it is intended to, that is, prevents the bear from

running away, but allows it some liberty of movement. If the trap were firmly fastened, the bear would quickly tear its foot from it; but being loose, it is dragged along by the bear, leaving a distinct trail by which the hunter can follow the animal and kill it.

The bear is very tenacious of life; its brain is very effectually protected by the skull, which is very thick, and it will carry off a number of bullets, unless shot through the heart.

When attacked, it rises up on its haunches, defending itself with its fore-paws, which are used as skilfully, and with as much ease, as a boxer's fists; at close quarters, it clasps its assailant in its powerful arms, hugging it to death.

The bear is a great traveller, constantly shifting from place to place in search of food. In its travels it confines itself to certain circuits, generally travelling the same paths, which are called *run-ways*. In these paths the hunter sets his traps, knowing that the bear will return the same way again. Its habits are nocturnal, although it sometimes travels in the daytime.

It is very fat in the fall, before going into its winter quarters, but on coming forth in the spring it is lean. The black bear is an excellent climber, often having its nest in a hollow tree, many feet from the ground. It is very fond of honey, robbing the hives of the wild bee, which it is very successful in finding.

The female usually has two cubs at a birth, although sometimes three or four. The period of gestation is uncertain, some authors stating it to be from six to seven weeks, others fourteen to fifteen weeks—one hundred days or seven months.

The black bear goes into winter quarters at the first heavy fall of snow. Its den is generally some fissure in the rocks, in which it makes a large bed of leaves and grass. I am informed that the male does not winter with the female, but has a nest by himself. I think this is doubtful.

Description.—Head short and broad; nose slightly arched, and pointed; snout somewhat pointed, and movable; eyes small, and near together; ears high, and somewhat rounded at the tips; body and limbs, strong and thick; feet strong; soles naked; claws long and curved; fur long and soft, color black, with sometimes a brownish tint.

DIMENSIONS.

Length of head, from 11 to 12 inches.

Greatest width of head, from 7 to 8½ inches.

Length of head and body, 5 feet 9 inches.

Order: RODENTIA.

Family: SCIURIDÆ.—(Squirrel Family.)

Characteristics.—Molars, ten in the upper and eight in the lower jaw, or eight in the upper and lower jaws, rooted or rootless. No ante-orbital foramen in the anterior root of the zygoma, or else small and rounded. Tibia and fibula distinct. (Baird.)

Genus: *Sciurus.*—(Linn.)

This genus includes the true arboreal squirrels. Some of its features are common to other genera in the family *sciuridæ*, but the following constitute peculiar characteristics: Head moderately small; ears small, erect; eyes large; snout and upper lip divided; incisors, two in each jaw, the upper, wedge or chisel-shaped at the extremity, the lower ones compressed laterally; molars tubercular, ten in the upper and eight in the lower jaw; body elongated; limbs strong; fore-feet with five toes and a tubercle, instead of a thumb; hind feet with five long toes, all furnished with long, hooked claws; tail nearly as long or quite as long in some cases longer than the body, with long bushy hair arranged on its sides, directed laterally; teats, eight in number, two pectoral and six ventral.

Sciurus Carolinensis, (Gmelin.)—GRAY SQUIRREL.

This beautiful animal is still common in this State. It is one of the most beautiful and graceful of the inhabitants of our forests, in which it generally makes its home, hardly ever venturing from them, unless occasionally, when the Indian corn is ripe, it enters the fields to add a little to its winter store of nuts; the amount which it pilfers could hardly be missed, however, unless the field should happen to be in or near the woods.

It prefers forests of chestnuts or oaks, in which its winter store can be readily collected. The first heavy frost is the signal for this work to commence, and the dropping of the chestnuts and acorns which the frost has loosened, accompanied by the rustling of the squirrel through the newly-fallen leaves as it gathers the nuts together, and carefully deposits them in hollow trees and crevices of rocks, or buries them in some secure place beneath the leaves, are the sounds most intimately connected with our woods in the autumn season.

The gray squirrel is often hunted, both for food and for its fur; its activity, the rapidity with which it scampers up and down the trees, and leaps from one tree-top to another, and the cunning with which it hides from the gunner, dodging to the opposite side of the tree from him, rendering the sport highly exciting.

The summer nest is built in some tall tree, at the junction of several limbs with the trunk. It is composed of sticks and leaves, and is lined

with soft grass and ferns; in this the young are reared, and live with the female till they are old enough to shift for themselves. At the approach of winter, some hollow in a tree is selected, sometimes the abandoned nest of a woodpecker, in which a warm nest is built, composed of grass and soft leaves; this is the winter home of usually the whole family. In early spring the young are driven off by the old ones, who soon build the summer nest, in which to rear another family. The young, after being driven off, soon pair, and in their turn become heads of families.

The habits of this animal are very interesting. You may be walking through the woods, shortly you hear what you at first think to be the barking of a small dog; on listening you discover your mistake; the abrupt notes *qua-qua*, with chattering gutteral additions, proceed from the tall tree a few rods from you; you cautiously steal on tip-toe to the foot of the tree, but do not see the animal even after looking carefully on every side. You know the little fellow is there, for he could not possibly have got out of the tree unless you had seen him. Now if you go close to the tree and step quickly to the other side you will see him whisk himself suddenly to the opposite side from you, where he is now closely hugging the tree and perfectly motionless; your interest has now become awakened, you are curious to see more of him; very well, you must retire a few rods and remain perfectly still. You had better take a comfortable seat, for he will not move while you are near the tree. Presently, you see his head with its bright, lively eyes slowly moving around to the side where you are; this is the first reconnoitering movement. If you remain perfectly still he will soon take his position on a limb, where jerking his tail and flaunting it in conscious security, he gives vent to his satisfaction at your removal, in a series of chattering barks, which are answered, perhaps, by other squirrels that you had no thought were in the neighborhood; soon one of them with a challenging bark or chatter, chases another and shortly three or four of them are scampering about, running through the fallen leaves, and up and down the trees in high sport; presently one of them in escaping from the others comes suddenly near you; with a shrill whistle of astonishment he scampers up the nearest tree and is soon as effectually concealed as all the others were the instant he gave the alarm. You may as well retire now, for you will see nothing more of these; as long as you remain near they will not budge a foot.

The gray squirrel is some years very common, and others very scarce; the reason for the increase and diminution of its numbers is uncertain. It may be owing to the plenty or scarcity of its food, or to migrations, or perhaps partially to both. Thompson in his "Quadrupeds of Vermont," says: "This sudden increase or diminution of their

numbers, seems to depend upon two causes, the supply of food and the severity of the winters. Their great multiplication generally follows a mild winter, which was preceded by a productive summer. I believe it to be generally true that when one species becomes very plentiful, the others become so too." There seems to be a considerable confusion regarding the identity of this species, some hunters declaring that they have shot two distinct species, and others three, in this State; but after examining carefully a great number that were shot in this State, and shot them myself, in different localities, I am confident that there exists with us only one species, although there are some which may be justly called varieties; indeed, Prof. Spencer F. Baird,* in his valuable "Report on the Mammals," pronounces the black squirrel *Sciurus niger* (Godman) that is sometimes found in this State, to be a variety of this species, and I have no doubt that such is the case, more especially as he had before him a series of specimens, showing very clearly the transition from black to the unquestionable gray. I have seen some specimens very dark, almost brown, that I knew were of this species and having such high authority, I shall not make two distinct species, but include them in *S. carolinensis*.

Description.—Head moderately large; ears rounded, covered posteriorly with short thin hairs; eyes large; whiskers long, the longest more than two and a-half inches, black; body strong, but well proportioned; limbs strong; feet naked beneath; toes provided with sharp, strong, curved claws; tail longer than the body; color above and on each side of the head, neck, body, and outside of the legs to the claws, a grizzled gray, caused by the fur which is cinereous next the skin, being tipped with black, white and ash; on the sides there is a wash of light ash, and on the legs and feet; on the back the fur is tipped with black, and a larger proportion of brownish ash than elsewhere on the body; beneath the whole body and between the limbs, white; the hairs on the tail are placed more on its sides than on the top or bottom, making it much wider than thick, they are ash-colored at their base, and for two-thirds their length black, and tipped broadly with white; the upper side of the tail is the darkest. The variations from this description are great and common, no two animals being alike. I have before me a specimen, brownish beneath, and on the head and between the legs; and have seen specimens varying from brown above, to the above description. There is also in the State Cabinet, a specimen entirely pure white, (this is probably an albino.)

DIMENSIONS.

Length of head, $2\frac{3}{8}$ to $2\frac{5}{8}$ inches.
Greatest width of head, $1\frac{1}{2}$ to $1\frac{3}{8}$ inches.

* Pacific Railroad Survey, Vol. VIII.

Length of head and body, 9 to 10 inches.
Length of tail, not including hairs at tip, 7 to 8½ inches.
Length of tail, including hairs at tip, 10 to 12 inches.
Length of hind-foot from heel to end of claw, 2½ to 3 inches.
Length of fore-foot from heel to end of claw, 1½ to 1¾ inches.

Sciurus hudsonius, (Pallas.)—Red Squirrel, Pine Squirrel, Chickaree.

This species is very common in this State, probably the most so of all the squirrels. Its lively disposition and sprightly habits would render it a great favorite, did it have a little more respect for the grain and fruit of the farmer; but unfortunately, the little thief pays frequent visits to the corn-field, and fruit trees, always selecting in the latter, the finest and ripest fruit; it also visits the strawberry bed, and is a great lover of nice ripe raspberries and cherries. These *failings* are certainly poor recommendations to the farmer, who after carefully training up some choice pear tree, beholds the first three or four blushing golden fruit, which promise him a sweet and delicious foretaste of the luxuries to come, hanging perfect pictures of beauty; he watches them patiently "grow in beauty side by side;" he visits them daily, and carefully removing all the leaves which obstruct the sun's rays, helps them in all that he can to ripen and become perfect; perhaps his imagination takes him to the next county fair, where prominent in all the choice fruit there collected, he beholds his beloved pears the observed of all observers; he gives a huge sigh of satisfaction, and waits; he waits! so does the squirrel, who has had his eye on those same pears nearly as long as their owner. They have now become nearly ripened; the beautiful blushes have now assumed their intensest brilliancy; the soft mellow tints of the ripened fruit have now, with all their charms, added to their value already great. To-morrow he will pick them, and after wrapping them carefully in tissue paper, he will place them in some secure place till they shall draw the premium they already have done in his imagination; but to-morrow is rainy, as is the day after; he does not visit those pears, and the squirrel noticing the neglect, *willingly befriends them*. The farmer on the first fair day, with basket in hand, repairs to the spot where his pets under his watchful care have grown to beautiful maturity; on nearing the tree he does not see them in their familiar places; the storm must have blown them to the ground; with hurried steps he reaches the tree and finds the core of one, the half of another, and mutilated remains of others scattered around; the marks of the teeth of the thief are plainly visible, and from that day forth it has in that farmer, at least, an implacable enemy.

The red squirrel, in collecting its winter's provisions, makes several depots, and the quantity in each is always liberal. It usually chooses

hollow trees and crevices in the rocks to deposit its stores in, often having a peck, and even a half bushel in some of them; walnuts, chestnuts, seeds of the pine, and different grains, go to make up its hoard. This species, like the gray squirrel, builds its nest of leaves and grass in the branches of some tree, but, unlike that animal, usually resides in it through the winter, although occasionally taking up its abode in a hollow tree, and sometimes in a crevice of a rock. The red squirrel is often found castrated; the other squirrels are also found in the same condition, but not so often, I believe, as this species. It has always been conjectured that this was done by the old one, and some pretend to say that they have seen the old male in the act, but there is no doubt that the emasculation is done by the larvæ of a fly, *(cuterebra emasculator.)* The egg is probably laid in the same manner as that of the bot fly of the horse, and the grub taking up its abode in the scrotum, consumes the testicles; this fact was discovered by Asa Fitch, entomologist to the New York State Agricultural Society. The following are some of his memoranda relating to this subject:—

"August 13, 1856. Peter Reid, of Lakeville, informs me that his cat, yesterday, brought into the house a striped squirrel, *(sciurus striatus.)* On taking it into his hands, he noticed its scrotum was enormously swollen and hard, with an orifice in it about the size of a wheat straw; and on pressing it with his fingers, he could distinctly feel the writhings of something alive in this tumor. On enlarging this orifice with the point of a penknife, he discovered it was a large grub, lying with its tail to the opening. It discharged, at intervals, three large drops of a fluid resembling grumous blood, mixed with purulent matter. On pressing upon it so as to protrude the tail end of its body slightly out of the opening, it exerted itself to crawl out, forcing its fluids into the part which was out of the orifice, so that it became swollen and hard, and then regurgitating them into the body again, whereby the extended portion became soft and collapsed, thus pressing upon and dilating the orifice, so that with three or four repetitions of this motion, it worked itself out, and dropped upon the floor. It proved to be a very large, soft, blackish grub, with numerous paler spots. It was about an inch long, and half as broad, oval, slightly depressed, divided into segments, with its surface covered with small, shining elevations, resembling the granular surface of Morocco leather." . . .

"Mr. Reid says the fact is well known to hunters, that of the gray and other squirrels killed in this vicinity, at least one-half of the males are castrated. It is the current opinion with them that this deformity is caused by the squirrels' seizing and biting out the testicles of their comrades, some of them strenuously maintaining that they have seen these

animals engaged in this act. There are some hunters, however, that say they have found two grubs in the scrotum of some squirrels, and they conjecture that it is by these that the testicles are destroyed." . . .

"September 1, 1856. Mr. Reid brings me a striped squirrel, with two grubs in its scrotum, considerably torn and injured by the coarse shot with which it was killed. These grubs are plainly the larvæ of a bot-fly, and not of a flesh-fly. They are lengthwise in the scrotum, one forward of the other, producing a tumor nearly an inch and a half in length. Each worm has a cavity for itself, separated from the other, with an orifice towards its hind part larger than the head of a large pin. Though the worms are probably immature, the testicles appear to be entirely consumed, but the parts are so torn that I do not attempt to trace out the exact lesion which they have produced." . . .

"I am therefore led to believe that these animals do attack each other in the manner that has been stated; not, however, for the purpose of emasculating their comrades, as has been supposed, but for the purpose of coming at and destroying these bot-grubs, the enemies of their race. We know the terror which some of these bot-flies give to the animals on which they are parasites, and the efforts which animals make to escape from them. The squirrel also is undoubtedly conscious that this insect is his greatest foe; he probably has sufficient intelligence to be aware that from the grub which is this year tormenting one of his unfortunate comrades, will come a descendant which next year may afflict him or some of his progeny in the same frightful manner. Hence his avidity to destroy the wretch, and thus avert the impending calamity. Future observations must determine whether this conjecture is correct. We fervently hope that the sportsman or other person who next witnesses a squirrel overpowered by its fellows in the manner stated, will kill that squirrel, and let the world know whether he does or does not find in it one of these grubs. If a grub is discovered, no doubt can remain as to the object of the other squirrels in making the attack which they do.". .

Description.—Head rather short and broad; ears rounded, thickly clothed within and without with hairs, which behind the ears form a tuft, rising above the ear in a pencil; whiskers long, black; muzzle hairy; body robust; limbs rather short; feet slender, the posterior ones hairy beneath, except a small pad on the sole and the tubercles beneath the toes, the anterior ones more naked; tail flat and narrow. Color; above and each side of the head, neck and body, and outside of the limbs, the fur is cinereous at its base, terminated with black and reddish-yellow, producing a grizzled appearance; a broad stripe, extending along the back from between the ears to the root of the tail is rufous; beneath the body, neck and chin, and between the limbs, white; the tail above is of

the same color as the dorsal stripe, margined with black and reddish-yellow; beneath the tail, the same color as on the sides of the body. Several specimens before me have the tail broadly banded with black at its extremity, with a rusty tip. There are several long, whisker-like hairs extending beyond the fur on the fore-legs, and beneath the body. I have noticed these on all the squirrels and weasels; they are probably designed for feelers.

DIMENSIONS.

Length of head, $1\frac{1}{2}$ to $1\frac{3}{4}$ inches.
Length of head and body, $6\frac{1}{2}$ to 7 inches.
Length of tail, not including the hairs at the tip, $4\frac{1}{2}$ to 5 inches.
Length of tail, including the hairs at the tip, $5\frac{1}{2}$ to $6\frac{3}{4}$ inches.
Length of hind foot to end of claws, $1\frac{3}{4}$ to $2\frac{1}{4}$ inches.

Genus: *Pteromys*.—(Cuvier.)

Characteristics.—Head rounded; ears short and rounded; eyes large; molars, ten in the upper jaw, eight in the lower; fore-feet, four-toed, with a rudimentary thumb having an obtuse nail; hind-feet, five-toed; the anterior and posterior limbs and feet connected together by a thin membrane, extending from the sides, which is densely clothed with fur above and beneath; on the fore-feet there is a slender bone springing from the thumb, which partially extends and strengthens this membrane when the animal is flying; tail nearly or quite as long as the body, thin and widened.

Pteromys volucella, (Pallas.)—Flying Squirrel.

This beautiful and interesting little animal is common in some parts of the State, but is generally rare. Its habits are nocturnal, it being very seldom seen in the daytime; it is an active, playful animal, and makes an interesting pet, being easily tamed. Numbers of them live together as families, usually in the hollows of trees. When travelling for amusement, or in search of food, this species uses its wings a great deal, sailing gracefully from tree to tree, alighting lower than it started, but running up the trunk or branches until high enough for another flight, (or sail, more properly,) its passage through the air being more like the sailing of a parachute than the flight of a bat or bird. Its food consists of nuts, principally, although grain is eaten readily by it. This is hardly its natural food, however, as it very seldom leaves the woods. It gathers together stores of food for winter use, but not such quantities as the other squirrels. It does not always build nests in the trees, like the arboreal squirrels, neither does it live in burrows beneath the ground, like the ground squirrels, but throughout the year resides in hollow trees. I think this species hibernates, partially, at least, but am not certain.

Description.—Head rounded; ears broad, slightly pointed, naked anteriorly and posteriorly; whiskers, long, black; anterior and posterior limbs enveloped in the membrane, except the feet, which are small and slender, and naked beneath; the toes of the anterior feet are separated distinctly, to nearly the ball of the foot; those of the posterior feet but little longer than them; all the toes hairy above, to the ends concealing the claws, which are sharp and curved. Color: above the head, body and membrane the fur is gray at its base, tipped with a light fawn-color; cheeks yellowish gray; beneath the body and membrane, yellowish white; the tail is long and flat, most of the hairs, which are soft and pliable, being placed on its sides. It is dark ash-colored above, lighter beneath.

DIMENSIONS.

Length of head, $1\frac{3}{8}$ to $1\frac{5}{8}$ inches.
Length of head and body, $4\frac{1}{2}$ to $5\frac{1}{2}$ inches.
Length of tail, without the hairs at the tip, $3\frac{3}{8}$ to $3\frac{7}{8}$ inches.
Length of tail, including hairs at tip, 4 to $4\frac{1}{2}$ inches.
Length of hind foot, 1 to $1\frac{1}{2}$ inches.
Length of fore-foot, $\frac{3}{4}$ to $\frac{7}{8}$ inches.

Genus: *Tamias.*—(Linn.)

This genus is readily distinguished from the other genera in the family *Sciuridæ*, by the following

Characteristics.—Permanent upper molars, eight, quite small; cheek pouches, ample, opening near the molars, and extending back to near the shoulder; "these pouches are capable of great distension, so as to hold a great supply of food;" tail shorter than the body, not bushy, the hairs on the sides short, making it hardly wider than thick; body rather slender than robust.

Animals of this genus have burrows in the ground, and in winter are in a state of semi-hibernation.

Tamias Striatus, (Linnaeus.)—Ground Squirrel, Chipmunk, Striped Squirrel, Striped Dormouse.

This beautiful and familiar species is very common with us, there being hardly a field but has several pairs living in the stone walls that enclose it. It is the most familiar of all the squirrels, often having its home within a yard or two of our dwelling-houses; its beauty, industrious habits, and cheerful activity would render it a very great favorite with all, and in fact does, with the exception of the farmer, who often may be obliged to plant the corn-field two or three times in consequence of a habit this little animal has of following the rows of newly sprouted corn and digging up the seed; the mischief done in this manner is

sometimes great, some farmers affirming that the ground squirrels destroy more corn than the crows. Another failing this animal has, is its love for strawberries, and its visits to the bed are not "few and far between." The ground squirrel is not a tree climber, seldom going in a tree unless forced to, to escape pursuit; its nest is in the ground, in the neighborhood of a stone wall, sometimes beneath it; it digs a long burrow, with several extensive chambers connected together by intersecting passages; in these chambers the winter's store of food is deposited; this consists of nuts, acorns, seeds and grains. In collecting this store, this little animal is very industrious, often gathering considerable quantities; I have known over a bushel to be taken from one burrow; the first approach of autumn is the signal for this work to commence, and from morning till night, until winter sets in, these animals may be seen hastening to their holes, their cheek-pouches distended to their utmost capacity. When the cold weather is really come, the squirrels retire to their burrow, sometimes several pair together, usually but the old pair and perhaps the young of the first year; here they remain, never venturing out during the winter, unless after a continued spell of warm weather. In early spring they are occasionally seen sitting on the rocks and fences sunning themselves, but they do not leave their burrows till late in the spring, when the young from four to six in number are born; their time is spent during the summer in rearing this brood, and preparing for the coming winter.

Description.—Ears large and rounded, covered with very short, fine hair; whiskers short; eyes rather large and full; neck rather thick; body rather slender than robust; limbs strong and longer in proportion than some of the other species; tail cylindrical at its root, gradually flattening to the end; posterior feet hairy beneath, except a naked pad on the sole and beneath the toes; anterior feet naked beneath. Color: above the head and back the fur is cinereous at its base, terminated with gray, black, and yellowish chestnut; on the back are seven distinct stripes running lengthwise with the body; they are placed in the following manner: in the middle of the back is a black stripe; running nearly parrellel with this on each side, nearly, or quite a half an inch from it are two dirty white stripes with a narrow black stripe on each side of them; on the sides of the body and outside the legs the fur is yellowish brown, lightest near the belly; beneath the head, neck and body, and between the legs, white; the hairs on the tail are terminated on the upper side with black, white, and tawny; beneath the tail, rufous to near the tip, which is black; the hairs being tipped with black and white, give the tail beneath, the appearance of being margined with those colors.

DIMENSIONS.

Length of head, 1½ to 2 inches.
Length of head and body, 5 to 6 inches.
Length of tail without the hairs at the tip, 3½ to 4¼ inches.
Length of tail with the hairs at the tip, 4½ to 4⅞ inches.
Length of hind foot, 1⅜ to 1⅝ inches.

Genus: *Arctomys*.—(Gmelin.)

Characteristics.—Head large, broad and flattened; ears short; eyes rather small than large; molars tuberculated, ten in the upper, and eight in the lower jaw; incisors, two in each jaw, less compressed than in *Sciurus*, and rounded anteriorly; body very thick, clothed with short, thin fur; limbs short and strong; feet strong, naked beneath, the anterior with four toes and a rudimentary thumb, and the posterior feet with five toes; all the toes furnished with long, thick and strong claws, which are slightly curved, adapted to digging but not to climbing; tail short, with long hairs, but not bushy. Animals in this genus live in burrows, in the ground, generally, if not always remaining torpid in them during the winter.

Arctomys monax, (Gmelin.)—Woodchuck, Ground Hog, Marmot.

This species is very common in this State; in a measure, it is regarded as a nuisance, in consequence of its depredations in the clover field and garden; but as a general thing, living as it does in the woods and fields, usually at a distance from our dwelling-houses, the mischief it does is not great, certainly not meriting the wholesale slaughter that it meets with at the hands of every farmer. It usually selects its home in the neighborhood of, or beneath a rock or stone wall; its burrow is long, sometimes consisting of several passages leading to a large chamber which is the summer and winter home.

The woodchuck, when feeding, is very careful not to have its retreat to its burrow cut off, usually eating a mouthful or two and then standing on its haunches, reconnoitres, always retreating suddenly to its burrow at the first suspicious movement, uttering a shrill whistle with a chattering termination; if its retreat is cut off, it will face a man or dog, giving battle with great courage, and the wounds it inflicts with its long, sharp incisors are often enough to drive off its assailant. I have often been successful in getting between them and their burrow, and the fight which was the invariable consequence, was highly exciting. I remember an instance which will clearly describe some of the habits of this animal. While haying one day, I noticed in an adjoining field an animal moving, which I soon recognized as a woodchuck; the field had been mown about a fortnight, and the tender leaves of the new clover

were scattered in little clumps over the stubble. The woodchuck was moving from the wall, in which its home was, into the field, eating the clover; he would gallop from one clump to another, his little short legs not permitting him to walk sufficiently fast, or with desirable ease; on reaching a cluster of clover, he would bite off a mouthful and eat it while standing on his hind legs and haunches, watching for a suspicious movement from the hay-makers in the adjoining field. I waited until he had got a sure distance into the field, and then cautiously crept behind the wall until I got opposite him, when I jumped over and walked towards him; he stood perfectly still until I got near him, when he made a rush to get by me, but I headed him off several times, until completely baffled; he stood still on his haunches, eyeing me wickedly, and chattering his long, sharp incisors. I touched his head with a pitch-fork handle, he growled and seized it, clinging tenaciously enough for me to lift him clear from the ground; when he let go I found a dent in the hard ash handle, nearly a quarter of an inch deep. I amused myself with him for a while, and then stepped aside, allowing him to pass me; he soon availed himself of the privilege, scampering as fast as his short legs would permit; I chased him when he got near the wall, and he turned to face me, but at length retreated, whistling and chattering, into his burrow.

The woodchuck often visits the kitchen garden, eating the vines of the pease and beans; but I am persuaded that the mischief which is charged to it is often done by other animals. There have been, in my knowledge, several cases where the gardens had been invaded, the pease beans and other vegetables destroyed, and the farmer, on watching, found the thief to be the common rabbit, (*L. sylvaticus.*) which animal often visits the gardens and orchards, doing considerable mischief. The woodchuck has from three to six at a birth, in the spring; the young usually pass the ensuing winter in the same burrow as the old ones, sleeping with them, huddled in a bunch. On the approach of cold weather, they retire to their burrow, closing its mouth with earth, to keep out the cold; here they remain torpid until the spring.

Description.—Head broad, tapering suddenly to the nose; ears very short and rounded, with hairs within and without, those behind the ear being long, extending beyond the ear; eyes small, placed far apart, about midway between the ear and nose; whiskers black, placed in several series on each side of the nose and face; neck short; body very short and thick; limbs short; feet naked beneath, the anterior four-toed, the posterior, five-toed; tail short, with long hairs, equally distributed on all sides. Color: above and on each side of the head and body the fur is dark gray at its base, then yellowish, then chestnut and tipped with white, producing a hoary appearance; beneath the body

and between the legs, rufous, tipped occasionally with white; feet black. Specimens vary from this description, but it is the common dress.

DIMENSIONS.

Length of head, $3\frac{7}{8}$ inches.
Greatest width of head, 3 inches.
Length of head and body, $15\frac{1}{2}$ inches.
Length of tail, not including the hairs at the tip, 5 inches.
Length of tail, including the hairs at the tip, $6\frac{1}{4}$ inches.
Length of fore-foot, $2\frac{1}{4}$ inches.
Length of hind-foot, $3\frac{1}{8}$ inches.

Family: MURIDÆ.—(Rat Family.)

Characteristics.—Incisors, two in each jaw, the lower ones compressed and pointed; some genera with cheek pouches; molars, usually six in each jaw, sometimes eight in the upper and six in the lower, and sometimes four in each jaw; these are rooted or rootless; body usually robust; limbs moderately short, clavicle, strong, and fully developed; tibia and fibula united below; the anterior feet almost always four-toed, with a tubercle supplying the place of the thumb; posterior feet five-toed; tail cylindrical, covered sparsely with short hairs. This family is much the most extensive of the order *Rodentia;* it includes the mice and rats, which, although never attaining any considerable size, are, in consequence of their great multiplication, and the injury which they do, worthy of serious notice and careful attention.

This family is divided into several sub-families, of which the following are represented in this State: *Dipodinæ*, *Murinæ*, (introduced?) *Arvicolinæ*.

SUB-FAMILY—DIPODINÆ.

Characteristics.—Body slender; posterior limbs greatly elongated, adapted to leaping; anterior limbs shortened; tail longer than the body, clothed thinly with short hairs.

Genus: *Jaculus.*—(Wagner.)

Characteristics.—Body slender; head rather large; nose sharpened; "incisors grooved longitudinally on their anterior faces;" molars, eight in the upper jaw, the posterior one much the largest, and six in the lower jaw, the anterior one the largest; all the molars tuberculated; anterior limbs short, furnished with four toes, and a tubercle supplying the place of a thumb; posterior limbs long, adapted to leaping; feet perfectly naked beneath; all the toes have thin, sharp, slightly curved claws; tail very long, with thin, short hairs springing between the scales, with which it is covered.

Jaculus hudsonius, (Baird.)—JUMPING MOUSE.

This beautiful and interesting little animal is not uncommon in this State, but it is seldom seen, on account of its nocturnal habits. It is not sufficiently numerous to do great mischief to the farmer, even if the seeds, which constitute the greater part of its food, were valuable, which is not the case. It should hardly, therefore, be included with the field mice in the slaughter they meet with at the hands of the farmer, and which they generally deserve. In escaping from pursuit, the jumping mouse usually progresses rapidly by a series of long jumps, often clearing four or five feet at a leap; these leaps are made so rapidly, and in such uncertain directions, (usually *zig-zag*, like the flight of a snipe,) that it is very difficult to catch it. It walks on all fours, like a common mouse, when not alarmed, and often will, in escaping, double on its tracks, and steal away through the grass, crouching close to the ground. This species, when in the woods, digs its burrow usually beneath a stump or log; this burrow is not very deep or complicated, usually having but one passage. In the fields it builds its nest, sometimes in a tussock of grass, or beneath a stone, or perhaps in a pile of rubbish. It sometimes lays up a winter store of seeds and grains, but it usually hibernates, although not in an entirely torpid state, it being almost always active on being discovered.

I once, in the winter season, while cutting up a partially decayed stump, found a nest with a pair of these animals; the nest was made of grass and leaves, there was no store of seeds or grain; whether or not the shock of the axe splitting the wood awoke them, they were lively, and soon escaped by their long leaps. The jumping mouse is not very prolific, bringing forth but three or four at a birth but once or twice a year.

Description.—Head large, long and pointed; ears moderate in size, clothed within and without with thin hairs; eyes small; whiskers scanty, brown and white; body slender, largest at the fore shoulders, tapering to the tail; anterior limbs short; posterior limbs very long; tail about twice the length of the head and body, cylindrical, tapering gently to the tip, and covered with scales, with short, thin hairs springing between them. Color: above the head, neck and body, yellowish brown, with numerous black tipped hairs; sides of the head, neck and body yellowish, with black hairs extending beyond the fur; the upper lip, and beneath the head, neck, body, and between the legs, white; feet, and beneath the tail, dirty white; above the tail, grayish-brown.

DIMENSIONS.

Length of head, from ⅞ of an inch to 1¼ inches.
Length of head and body, 2½ to 3 inches.
Length of tail, without the hairs at the tip, 5¼ to 5½ inches.
Length of tail, with the hairs at the tip, 5½ to 6 inches.

Length of fore-foot, $\frac{3}{8}$ to $\frac{1}{2}$ an inch.
Length of hind-foot, $1\frac{1}{4}$ to $1\frac{3}{4}$ inches.

SUB-FAMILY—MURINÆ.

Characteristics.—Incisors compressed laterally; molars, six or eight in each jaw, rooted, the anterior largest, the posterior smallest; ante-orbital foramen a deep narrow slit, widening above; palate mostly on one plane; descending ranus of lower jaw with the angles not situated above the plane of the crowns of the molars. (Baird.)

Genus: *Mus.*—(Linnæus.)

Characteristics.—Head large; ears moderately large, nearly naked; molars tuberculated, six in each jaw; eyes small; cheek pouches wanting; body robust, covered with thick fur, with long hairs extending beyond; limbs short; fore-feet four-toed, sometimes with a tubercle supplying the place of the thumb, sometimes with a claw; hind-feet five-toed; all the toes furnished with sharp, strong claws; tail nearly as long, or quite as long as the head and body, covered with short scales, between which spring short, stiff hairs.

Mus decumanus, (Pallas.)—NORWAY RAT, BROWN RAT.

The habits of this common species are too well known to need any description here; it was undoubtedly introduced into this country from Europe, it being precisely similar to the Norway rat of that continent. It is a strong, ferocious animal, and, when cornered, will fight savagely. It is completely acclimated here, living in the woods, fields and dwellings. It is a nuisance to the farmer, doing great mischief in the grain-fields and corn-houses, and often kills young chickens, ducks and turkies, and is a great lover of eggs. This animal is very prolific, having seven or eight at a litter twice or three times a year.

Description.—Head long, and pointed to the nose; ears large, rounded, and nearly naked; whiskers long, brown, and whitish; body robust; limbs strong; feet broad, naked beneath. Color: above and on the sides the fur is cinereous at its base, then reddish-brown, and tipped with brown or black; there are numerous black hairs growing in and extending beyond the fur; beneath the body the fur is gray at its base, lighter, sometimes white at the tip; tail about as long as the body, with short, sparse hairs growing from between the scales, with which it is covered.

DIMENSIONS.

Length of head, $1\frac{1}{2}$ to 2 inches.
Length of head and body, 6 to 9 inches.
Length of tail, $5\frac{1}{2}$ to 7 inches.
Length of hind-foot, $1\frac{1}{2}$ to $1\frac{7}{8}$ inches.
Length of fore-foot, $\frac{7}{8}$ to 1 inch.

Mus musculus, (Linn.)—COMMON MOUSE.

This species is the common house mouse; its habits are well known. Like the brown rat, this animal was introduced from Europe; it is now very thickly and generally distributed over this continent, wherever there is a settlement, its great fecundity allowing it to thickly populate, in a year or two, a large district. It has many enemies, fortunately, keeping its numbers within a certain limit. The common mouse in this country assumes the habits of the field mice, often living in burrows in the fields. It often makes its home in the hay-mow, where it spoils the hay, biting it up into fragments, and giving to it the offensive odor which this animal has. Cattle refuse to eat the hay in which numbers of these vermin live, in consequence of this odor.

Description.—Head rather rounded, but not much so; nose sharp; ears large, nearly naked; body short and thick; legs slender; tail as long as the body, with short hairs growing between the scales. Color: above and on the sides the fur is gray at its base, tipped with brownish; beneath the body grayish-ash.

DIMENSIONS.

Length of head, $\frac{3}{4}$ of an inch.
Length of head and body, $3\frac{1}{2}$ inches.
Length of tail, $3\frac{1}{8}$ inches.

Genus: *Hesperomys*.—(Waterhouse.)

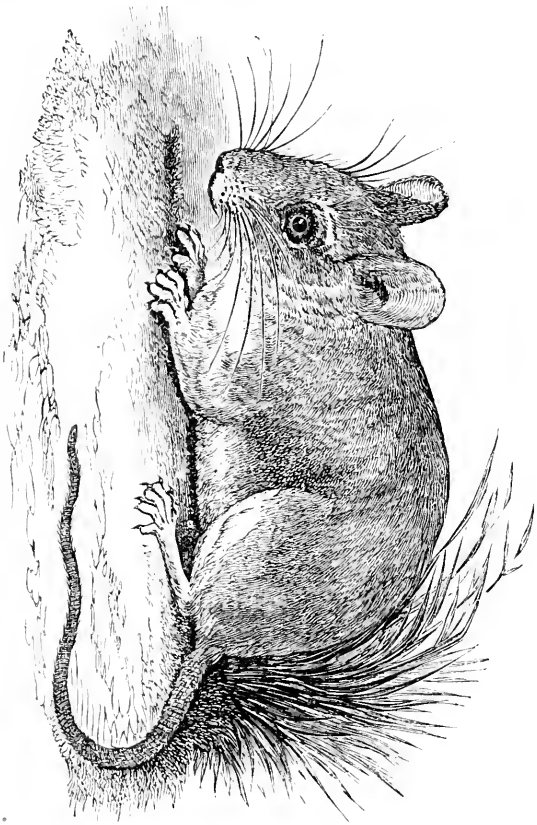
Characteristics.—Head, of moderate size, pointed to the muzzle; eyes large; ears large and rounded, nearly naked; body slender; limbs slender; feet provided with sharp, curved claws; tail cylindrical, slender, with much longer hairs than in *mus*, the scales on the tail being nearly concealed by them.

Hesperomys leucopus, (Wagner.)—WHITE-FOOTED MOUSE, DEER MOUSE.—[Fig. 4.]

This species is very common in this State, and is nearly or quite as generally diffused throughout the continent as the common mouse. Its habits are well known, requiring but little mention here. It is very active, and an excellent climber, often making its home in a hollow tree, thirty or forty feet from the ground. It is very troublesome to the farmer, spoiling the hay in the mow, and the grain in the bin. I have often seen it in dwellings, living like a common house mouse; it does some mischief in the nurseries and orchards, by gnawing the bark of the trees; this is most often the case in severe winters, when its food is exhausted, or covered up in the snow. The White-footed Mouse builds a large nest, often in the branches of a tree or bush; it also often occupies

a deserted bird's nest. It has from two to eight young at a litter in this State, twice a year. The young are often found hanging to the teats of the old one; this is the case with other species, however.

Description.—Head of moderate size, rather broad; ears large, rounded above, and nearly naked; body not robust, rather delicate; limbs slender; feet, naked beneath the toes and ball of the foot; the rest of the surface



Hesperomys leucopus.—White-footed Mouse, Deer Mouse. [Fig. 4.]

beneath the feet hairy; the toes on the anterior feet a little the longest; tail round, slender and tapering, with short hairs growing between the scales, nearly concealing them. Color: above and on each side, yellowish-brown, the fur on the top of the head and back darkest; beneath the body and between the legs and the feet, white.

DIMENSIONS.

Length of head, $1\frac{1}{8}$ to $1\frac{1}{4}$ inches.
Length of head and body, $3\frac{1}{4}$ to $3\frac{3}{4}$ inches.
Length of tail, not including hairs at the tip, $3\frac{1}{4}$ inches.
Length of tail, including hairs at the tip, $3\frac{5}{8}$ inches.

SUB-FAMILY—ARVICOLINÆ.

Characteristics.—Head moderately large, broader and deeper than in the other sub-families; ears short, generally hidden in the adjacent fur; incisors, nearly or quite as broad as long; molars, six in each jaw; snout blunt; body moderately robust; tail short, sometimes not so long as the head, usually thickly clothed with hair.

Genus: *Arvicola.*—(Lancepede.)

Characteristics.—Body small; tail short, usually less than half the length of the body, cylindrical, covered with hairs. Animals in this genus burrow in the earth, and feed on grasses, bulbous roots, seeds and grains; sometimes omnivorous. They do not hibernate, but are active through the winter, seeking their food through the deepest snows.

The following remarks will apply to all the species found in this State. The short-tailed field mice, included in the above genus, are of small size, with shorter and heavier bodies than the true mice. Their food is composed of grasses and other plants, with their seeds and roots, and the bark of trees; they are very injurious to the farmers, both by destroying the plants in the grain-fields, the roots and stems of the grasses used for hay, and by injuring the fruit trees, in gnawing off the bark.

Robert Kennicott* says: "The greatest mischief done by meadow mice, is the gnawing of bark from fruit trees. The complaints are constant and grievous, throughout the Northern States, of the destruction of orchard and nursery trees by the various species of *arvicolæ*. The entire damage done by them in this way may be estimated, perhaps, at millions of dollars. If any think this too large an estimate, let them inquire, even in a small neighborhood, where much attention is paid to fruit-growing, and it will be found that, wherever they abound, the injuries committed by these pests are frequently among the most serious difficulties encountered by the pomologist." . . . "The mice are most mischievous in winters of deep snow. It is usually thought that they only knaw bark when no other food is to be obtained; but it is more probable that this is palatable to them at all times. Confined specimens, while abundantly supplied with food of all kinds, ate the bark from twigs placed in their cage. One reason why fruit trees are most girdled in times of deep snow is, that the meadow mice can then better move about at a distance from their burrows, being protected by the snow, under which they construct numerous pathways, and are thus enabled to travel comfortably in search of food, always to be obtained in abundance, where there is any kind of perrennial grass, or the seeds of annual

* Patent Office Report, 1856, page 85.

plants. Aided by the snow, too, they climb up at the sides of the trees, to gnaw the bark, at a considerable height from the ground. Rabbits are often accused of gnawing bark from trees, when the mischief has really been done by meadow mice. Not a little injury do they do vegetables of all kinds, destroying young plants of pease, beans, cabbages, &c., as well as digging up seeds of all sorts, and gnawing potatoes, beets, and other roots; in short, the catalogue of their depredations is endless." With their exceeding fecundity the meadow mice would become unbearably numerous were it not for their great number of enemies, among which the butcher bird *(Lanius borealis.)* The owls, snakes and weasels are particularly active. Domestic cats are very fond of them, and destroy great numbers. The snakes, if protected by the farmer, and they should be, would do much to keep these pests reduced, in numbers. They can readily enter the burrows of the mice, and possessing voracious appetites, destroy great numbers; but the farmer, the moment he sees a snake, no matter if it is perfectly harmless, (and all our snakes are, with the exception of the rattlesnake,) kills it; thus destroying one of his greatest benefactors, living as it does on insects principally, but often catching these mice.

The meadow mice are often carried to the barns and granaries in hay and grain, where they soon make their homes, destroying the hay by biting it up into fragments, and the grain, by eating the germ.

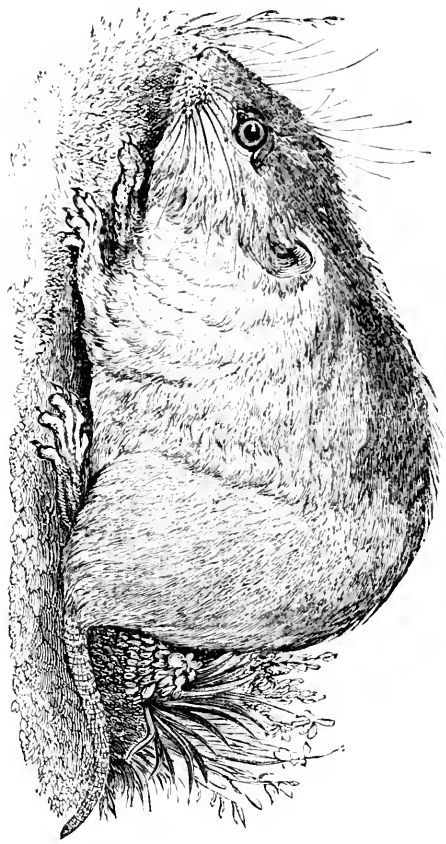
Arvicola gapperi, (Vigors.)—RED-BACKED MOUSE.

This small species is common in this State. It prefers the neighborhood of a swamp or meadow, and is an excellent swimmer. Not having specimens of this and the three following species, by me, I borrow the descriptions given by Prof. Baird.

Description.—"Size small and slender, about like that of the domestic mouse, $3\frac{3}{4}$ inches long; skull about .9 of an inch; ear large, two-thirds the hind-foot; prominent above the fur; well and closely furred with short hair; antitragus large; tail vertebræ, about twice as long as the hind-foot; back, with a broad stripe of uniform bright rufous brown; sides sharply defined, yellowish gray, mixed with brown; muzzle similar; beneath, dull yellowish white; tail sharply bicolor, grayish and black mixed above, whitish beneath, dusky at the tip."

DIMENSIONS.

Length of head, 1 inch.
Length of head and body, $3\frac{1}{2}$ inches.
Length of tail to end of vertebræ, $1\frac{3}{8}$ inches.
Length of tail to end of hairs at tip, $1\frac{3}{5}$ inches.
Length of hind-foot, $\frac{3}{4}$ of an inch.
Length of fore-foot, $\frac{2}{3}$ of an inch.



Arvicola riparia.—MEADOW MOUSE. [Fig. 5.]

Arvicola riparia, (Ord.)—MEADOW MOUSE, BANK MOUSE.

This common species is very often met with. It prefers the neighborhood of a swamp, and swims and dives well.

Description.—"Size large; head and body measuring 4½ inches; tail more than one-third this length; feet very large, scaly; hair rather short; above, dark brown, varied with reddish or yellowish brown; beneath, pure ashy plumbeus; tail and feet dusky, the former scarcely lighter beneath."

DIMENSIONS.

Length of head, $1\frac{2}{5}$ inches.
Length of head and body, 4½ inches.
Length of tail to end of vertebræ, $1\frac{3}{4}$ inches.
Length of tail to end of hairs, 2 inches.
Length of hind-foot, $\frac{4}{5}$ of an inch.
Length of fore-foot, $\frac{3}{10}$ of an inch.

A. Breweri, (Baird.)—GRAY MOUSE.

This species is said to be abundant on the Island of Muskeeget, on the eastern coast of Massachusetts, where, Prof. Baird says, the only specimens he has seen were collected by Dr. Brewer.

Description.—Size large; feet very broad and stout; soles with six tubercles; fur coarse; ears small; above, pale grayish-yellow; brown beneath, with the under surface of the tail, and the upper surfaces of the feet strongly hoary or ashy-white, with a tinge of yellow.

DIMENSIONS.

Length of head 1.31 inch.
Length of head and body, 4.30 inches.
Length of tail to end of vertebræ, 1.65 inch.
Length of tail to end of hairs, 1.94 inch.
Length of hind-foot, .85 of an inch.
Length of fore-foot, .41 of an inch.

A. rufidorsum, (Baird.)

This species is very rarely found, if it is a species existing with us. Prof. Baird says, the only specimen he has ever seen was obtained at Holmes' Hole, Massachusetts, and belongs to the Boston Society of Natural History.

Description.—Size large; above, bright rufous, or reddish-chestnut; this tint paling insensibly to the belly, where it changes rather abruptly to reddish-white; no dorsal band; feet reddish; under surface of tail whitish.

DIMENSIONS.

Length of head and body, 4.20 inches.
Length of tail to end of vertebræ, 1.55 inches.
Length of tail to end of hairs, 1.85 inches.
Length of hind-foot, .82 of an inch.

Genus: *Fiber.*—(Cuvier.)

Characteristics.—Incisors, two in each jaw; molars, six in each jaw, with zig-zag laminæ; body large; limbs short; hind-feet partly webbed; toes with strong, somewhat curved claws; tail long, compressed laterally; with anal glands, secreting a liquid with a strong musky odor.

This genus is composed of a single species, the Musk Rat. It is confined to this continent, where it is extensively and generally distributed.

Fiber Zibethicus, (Cuvier.)—MUSK RAT.

The habits of this common species are too well known to need particular mention here. It is almost entirely aquatic, seldom venturing

much distance from the water. Its burrow, in summer, is in the banks of a stream or pond, and it has an opening beneath to the water, through which it always retreats at the first sign of danger; in winter it builds a large nest of grass, sedge, and the leaves and stalks of the water lilly. This nest is not open on any side, the entrance being from beneath, into the water. Its food consists principally of the roots of water plants, and fresh water clams, but it is sometimes omnivorous; the numbers of the clams which it destroys are very great, quantities of the shells often being found lying on the banks of the streams and ponds frequented by this animal. In the spring, when the rivers are swollen, the nests of the musk rats being flooded, the animals are often shot in great numbers by gunners in boats. I have known instances where a boat full, the results of one day's sport, richly repaid the hunter.

The Musk Rat, in this State, can hardly be called injurious to the farmer, but it does, sometimes, considerable mischief in burrowing in milldams, the water forcing its way in, sometimes carries away the entire dam. The young, from three to six or seven, are born in the spring. I have found young ones in a nest, in February. I am not aware that it has more than one litter in a year; they live with the old ones through the first winter. Sometimes the ice beneath and around their home becomes so thick that it is impossible for them to effect an egress, when the weakest furnish food for the others, successively, the strongest being the survivor.

Description.—Body thick; eyes small; ears nearly concealed in the adjacent fur; limbs short; hind-feet large, with five toes webbed for half their length; fore-feet, with four toes and a rudimentary thumb, with a claw half as large as those on the fingers, which are webbed at their bases; all the feet naked beneath; tail compressed laterally, cylindrical at its base, and covered with small scales with very short, scant hairs between them; fur, two kinds, a very soft, thick fur next to the skin, with a long, hairy fur extending beyond it; color of the basal fur, gray, tipped with bright brown; this is the color beneath the body; the outer, hairy fur of the back and sides is dark brown; beneath the chin and throat, ashy; feet dark brown.

DIMENSIONS.

Length of head, 3 inches.
Length of head and body, 13 inches.
Length of tail, 10 inches.
Length of hind-foot, 3 inches.
Length of fore-foot, 1½ inch.

Family: LEPORIDÆ.—(Hare Family.)

Characteristics.—Head long and compressed; ears long and erect; eyes large and prominent; incisors, four in the upper, and two in the lower jaw, the two middle ones of the upper jaw much the largest; molars twelve or ten in the upper, and ten in the lower jaw; hind limbs, long, adapted to leaping; anterior feet, five-toed; posterior feet, four-toed; tail short or wanting. Animals in this family are timid, always seeking safety in rapid flight.

Genus: *Lepus.*—(Linn.)

Characteristics.—"Molars, twelve in the upper, and ten in the lower jaw; ears large, nearly as long, or longer than the head; tail short and bushy; hind-legs powerful, and much longer than the fore-legs." This formula is given by Baird, in his admirable report on the mammals. But two species represent this genus in this State, the *L. Americanus*, and the *L. sylvaticus;* their habits are similar, though the former seems to show a preference to the higher lands, and the latter, the swamps; but they are both found in the same places.

Lepus Americanus, (Erxleben.)—NORTHERN HARE, WHITE RABBIT.

This common species is often met with in this State. Its habits are well known, and require but little mention here. It seems to prefer the extensive woods to the pastures and swamps, and very seldom ventures into the fields. On being hunted by dogs, it doubles on its tracks often, and winding through thick clusters of entangled undergrowth, very often throws its pursuers off its track; it does not take refuge in holes in the earth, as does the common rabbit, on being hard pressed, but depends entirely on its strength and the thickness of the woods; it is often caught in snares, baited with an apple, and in box-traps. Its flesh is excellent and a great favorite; its fur is pretty good, but is not used by furriers to any extent. In the daytime the hare does not move around much, but remains concealed beneath a clump of bushes or in a bunch of brush; this is called its *form.* It has numerous enemies, and were it not prolific it would soon be exterminated. The young are usually five, or six in number, and two litters are born in a year. The nest is composed of dried grass and leaves, lined with the fur pulled from the body of the old one; it is built usually beneath a clump of bushes, and when the old one leaves it she covers the young carefully with leaves and grass. The young leave the parent when quite small, being much more able to take care of themselves than the common rabbit of the same age.

Description.—Head, rather short; ears, long—about the length of the head—they are placed far back; body, long; legs, long, the posterior

nearly twice as long as the anterior; feet, clothed beneath with dense, furry hair; tail, very short, covered with thick fur. Color: in summer, on the upper parts the fur is gray at its base, then reddish-yellow, tipped with brown; ears, brown, with black margin at the ends; beneath the chin and under the throat, white; neck, ash; beneath the body and inside the legs, white; tail, brown above, white beneath; in winter this is changed to a nearly pure white, except the black edge of the ears; hair on the soles of the feet, yellowish throughout the year.

DIMENSIONS.

Length of head, $3\frac{1}{2}$ to $3\frac{3}{4}$ inches.
Length of ear, $3\frac{1}{4}$ to $3\frac{1}{2}$ inches.
Length of head and body, 17 to 19 inches.
Length of tail, including hairs at the tip, 2 to $2\frac{1}{2}$ inches.
Length of hind-foot, $4\frac{3}{4}$ to $5\frac{1}{2}$ inches.
Length of fore-foot, $2\frac{1}{2}$ inches.

Lepus sylvaticus, (Bachman.)—Common Rabbit, Gray Rabbit.

This is one of our most common animals; there is hardly a patch of woods of an acre in extent but has one or two in it—sometimes a larger number. Its habits are greatly similar to the preceding species, and may be described in a few words. It is nocturnal, lying concealed during the day in its *form* beneath a clump of bushes; when pursued, it soon takes refuge beneath a rock, or in a hole in the ground or wall, or in a hollow tree; it builds a nest of grass, and pulls fur from its body to line it with; in this the young are born, sometimes seven or eight at a litter; two litters are born during the spring and summer; I have known cases where three were born, but these were exceptions to the general rule; the young leave the parent when quite small—sometimes when but two or three weeks old. The gray rabbit often visits the fields and orchards, and does considerable mischief in the vegetable garden, eating the tender plants of the pease, beans, cabbages and turnips; when frightened, this animal always stops and listens for a moment, sometimes regarding its visitor curiously till a movement from him startles it, when, with a quick, leaping run, it disappears. This species is trapped in snares and box-traps, baited with apples. The flesh is superior to that of the hare. In winter it lives in a burrow in the ground—sometimes in a ledge of rocks.

Description.—Head, rather short and rounded; ears, shorter than the head; eyes, large; limbs, moderately long; feet, with thick, stiff hair beneath, which conceals the claws, which are long, sharp and nearly straight; tail, short, completely covered with thick, long fur. Color: on the head above and each side, ears, back and sides of the body, outside the

limbs and the upper side of the tail, the fur is gray at its base, tipped with yellowish-brown; in this fur, and extending beyond it, is another more hairy fur, which is gray at its base, tipped with light brown and black; this gives the color to the animal on its back and sides; beneath the chin and throat, the upper lip, and beneath the body and tail, and between the legs, the fur is gray at its base, tipped with white and light ash; breast, the color of the sides; beneath the feet, yellowish-brown.

DIMENSIONS.

Length of head, $3\frac{1}{4}$ to $3\frac{1}{2}$ inches.
Length of head and body, 14 to 16 inches.
Length of ears, 3 to $3\frac{1}{4}$ inches.
Length of tail, not including hairs at tip, 1 inch.
Length of tail, including hairs at tip, $2\frac{1}{4}$ inches.
Length of hind-foot, $3\frac{1}{2}$ to 4 inches.
Length of fore-foot, $1\frac{1}{2}$ to 2 inches.

Order: RUMINANTIA.

Family: CERVIDÆ.—(Deer Family.)

Characteristics.—Head generally furnished with horns which are solid and shed, in most species, annually; ears, large; incisors, wanting in the upper jaw, eight in the lower jaw; molars, twelve in each jaw; body, well proportioned; limbs, long and slender; feet, bifid.

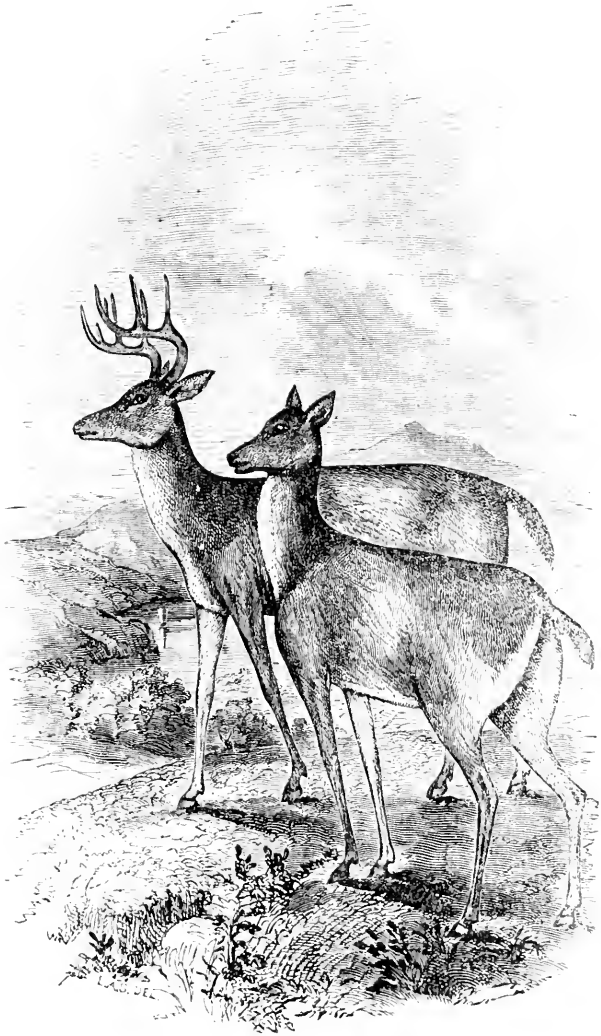
Genus: *Cervus.*—(Linn.)

Characteristics.—Heads of the males always furnished with horns, which are branched, sub-palmated or simple; nose, naked and moist; ears, large; mammæ, four, placed between the thighs; tail, short, bushy.

Cervus Virginianus, (Boddært.)—AMERICAN DEER. [Pl. II.]

This beautiful animal is now rare in this State and will soon, probably, be extinct; it is found in the woods in Plymouth and Barnstable counties, in the neighborhood of the Hoosac mountains, and on several of the islands on the south-east coast. It possesses great muscular power, and runs with surprising speed; having a keen sense of hearing and smelling, and, being very timid and shy, it is very difficult to be approached. During the rutting season the males are restless and bold, and will often attack man,—the wounds it inflicts with its antlers and sharp hoofs rendering it an ugly customer; when alarmed it stamps the ground and emits a shrill whistle through its nose. Its horns are shed in winter in the following manner: the young horns, growing on processes of the frontal bone, are increased in size beneath the skin, by an action analagous to that by which injuries to the bones are repaired; as they become

[Plate II.]



Cervus virginianus.—American Deer.

matured they become ossified, until, completely developed, the skin beneath which they were formed, and by which they are still covered, dries up and peels off leaving them bare bone; the blood vessels at their base soon become connected together and refuse nourishment to the horns, which now are *solid, dead* bone, requiring no effort of nature to detach them from the skull, but are removed by accident.

The female has one or two young in early summer. The fawns are at first reddish, spotted with white. They lose their spots in autumn and become gray in winter. In the fall the deer are in good condition, and their flesh, which is called venison, is delicious; in the winter they herd together, and when the snow is deep they tread it down in large patches which are called yards, in these they remain, browsing on twigs and mosses; hunters follow them to these yards where they often destroy the whole herd. This practice should be condemned, as by it the deer are greatly reduced in numbers, and if it is followed up to any extent it will be the sure means of their extermination. The following laws, (General Statutes, chapter 82,) which took effect on and after the 31st of May, 1860, if faithfully enforced, will protect to some extent these animals in this State:—

SECTION 12. Whoever between the first day of January and the first day of August kills or hunts any deer, except his own tame deer, or deer kept in his park or on his own land, shall for every such offence forfeit twenty dollars.

SECTION 13. Whoever at any time of the year hunts, chases, or kills, with hounds or dogs, any deer within the counties of Plymouth or Barnstable shall for every such offence forfeit twenty dollars.

Description.—Head, rather long; muzzle, sharp; ears, long and broad; eyes, large and lustrous; body, slender; limbs, long and slender; hoofs, long and narrow, false hoofs, long; tail, long and bushy, widest laterally. Color: head and ears, back and sides, and the upper side of the tail, light chestnut red; beneath the chin, throat, belly, inside the legs, and under side of the tail, white; this is the spring and summer dress, in winter there is a considerable sprinkling of grayish hairs.

DIMENSIONS OF A FINE BUCK.

Length of head, 12 inches.
Length of ear, 6 inches.
Length of head and body, 5 feet 5 inches.
Length of tail to the end of the hairs, 11 inches.
Length of tail, not including the hairs, 8½ inches.

CATALOGUE OF ANIMALS EXTINCT IN THIS STATE.

Those marked *, are rare visitors.

* *Vespertilio subulatus*, (Say.)—Little Brown Bat.
Felis concolor, (Linn.)—Panther.
**Lynx rufus*, (Raf.)—Wild Cat.
* *Lynx canadensis*, (Raf.)—Canada Lynx.
Canis occidentalis var. griseo-albus.—White and Gray Wolf.
Vulpes fulvus, var. decussatus.—Cross Fox.
Vulpes virginianus, (De Kay.)—Gray Fox.
Mustela americana, (Turton.)—Pine Marten; American Sable.
Mustela Pennantii, (Erxl.)—Fisher; Black Cat.
**Putorius nigrescens*, (Aud. and Bach.)—Little Black Mink.
* *Ursus americanus*, (Pallas.)—Black Bear.
Castor canadensis, (Kuhl.)—American Beaver.
**Erethizon dorsatus*, (Cuv.)—White-haired Porcupine; Berkshire Co.
Alce americanus, (Jardine.)—American Moose.
Rangifer caribou, (Aud. and Bach.)—Woodland Caribou.
Cervus canadensis, (Erxl.)—American Elk.

MAMMALOGY.

The following additions have been made to the State Cabinet, in this department:—

Brown Bat, *(Vespertilio Carolinensis.)* male, female and four young.* Presented by J. W. P. Jenks.

Short-tailed Shrew, Mole Shrew, *(Blarina talpoides.)* four specimens.* Presented by J. W. P. Jenks.

Star-nosed Mole, *(Condylura cristata, Ill.,)* a fine specimen.* Presented by E. A. Samuels.

Star-nosed Mole, *(Condylura cristata, Ill.,)* two specimens.* Presented by J. W. P. Jenks.

Bay Lynx, Wild Cat, *(Lynx rufus,)* Raf.—A fine specimen. Presented by J. S. Grennell.

Least Weasel, *(Putorius pusillus,)* Aud. and Bach.—One specimen.* Presented by J. W. P. Jenks.

Small Brown Weasel, *(Putorius cicognanii.)* Bp.—One specimen,* winter dress. Presented by J. W. P. Jenks.

Ermine, *(Putorius noveboracensis.)* De Kay.—One specimen,* summer dress. Presented by J. W. P. Jenks.

Jumping Mouse, *(Jaculus hudsonius,)* one specimen.* Presented by C. C. Sewall.

Solomon Talbot presents a monstrosity of a calf with two heads, seven legs, and a double body, for one-half its length, anteriorly.

* Alcoholic specimens.

ORNITHOLOGY.

This department has been largely increased, by the following additions:—

Broad-winged Hawk, (*Buteo Pennsylvanicus,*) female. Presented by A. Scott.

Bay-breasted Warbler, (*Dendroica castanea,*) Wils.—Young. Presented by Alden Bachelder.

Black-poll Warbler, (*Dendroica striata,*) young female. Presented by Henry A. Purdie.

Rose-breasted Grosbeak, (*Guiraca ludoviciana.*) Presented by Alden Bachelder.

Blue Heron, (*Florida cærulea.*) male. Presented by Capt. E. W. Gardner.

Night Heron, (*Nyctiardea gardeni.*) young. Shot in Bedford, in December. Presented by C. M. Fitch.

Wilson's Plover, (*Aegealitis Wilsonius,*) young male.† Presented by Henry A. Purdie.

Black-bellied Plover, (*Squatarola helvetica.*) young. Presented by J. P. Haskell.

Wilson's Plover, (*Aegealitis Wilsonius.*) male and female.† Presented by E. A. Samuels.

Least Sandpiper, (*Tringa wilsonii,*) male and female.† Presented by E. A. Samuels.

Semi-palmated Sandpiper, (*Ereunetes petrifactus,*) male.† Presented by E. A. Samuels.

Sanderling, (*Calidris arenaria.*) Presented by J. P. Haskell.

Sanderling, (*Calidris arenaria.*) female.† Presented by E. A. Samuels.

Spotted Sandpiper, (*Tringoides macularius,*) female.† Presented by H. A. Purdie.

American Widgeon, (*Mareca americana,*) male. Presented by S. Cabot, Jr.

Loon, Great Northern Diver, (*Colymbus glacialis,*) male.† Presented by A. Scott.

Little Auk, Dove-kie, (*Mergulus alle.*) One specimen presented by W. G. Weld, and one specimen presented by J. P. Haskell.

OOLOGY.

The following additions have been made to this department, the past year:—

Nest and eggs of Humming Bird, (*Trochilus colubris.*) Presented by W. H. Floyd.

† Skins.

Two eggs of Purple Grakle, (*Quiscalus versicolor.*) Presented by T. S. Brigham.

Nest of Black Duck, (*Anas obscura.*) Presented by W. H. Floyd.

Egg of Wilson's Tern, (*Sterna Wilsoni.*) Presented by T. S. Brigham.

CONCHOLOGY.

T. C. Haskell presents the following species:—

Pecten Islandicus; Astarte sulcata; Venus gemma; Mactra ponderosa; Mesodesma deaurata, young; *Solen ensis; Pandora trilineata; Cerithium Sayi; Buccinum undatum; Buccinum plicosum; Tritonium pygmæum; Tritonium decemcostatum; Columbella lunata; Bulimus labricus, Helix albolabris; Helix cellaria; Helix nemoralis; Tritonium Islandicum*, (Grand Banks); *Tritonium ventricosum; Buccinum ciliatum; Cyprina Islandica; Thracia Conradi; Mytilus decussatus; Teredo navalis*, and wood completely honey combed by this species; *Balanus geniculatus*, with *Saxicava* imbedded; *Petricola pholadiformis.*

MISCELLANEOUS.

O. S. Kent presents partially fossilized bones, and lower jaw of horse, found in Methuen.

B. Pulsifer presents specimens of marble and porphyry, the latter from the great rock at Nahant.

T. C. Haskell presents specimen of chalcedony, from Marblehead.

ENTOMOLOGY.

Extensive contributions have been made to this department, in addition to the collections made by the curator, Mr. Francis G. Sanborn.

A series of boxes has been prepared for the reception of the specimens, which are securely protected from the chief enemies of the cabinet, —dust, light, and destructive animals. The former collection, arranged and labelled on scientific principles, having been entirely destroyed, with the exception of the alcoholic portion, for want of suitable accommodations; and a different arrangement being deemed necessary for the purposes of an Agricultural Cabinet, the following plan has been adopted: The front of the case bears the inscription "Insects of Massachusetts," beneath which, the drawers, in three columns of fifteen each, are respectively headed "Injurious," "Beneficial," and "Miscellaneous." The first column is again divided as injurious "*to Fruit-trees*," "*to Timber-trees*," "*to Cereals*," &c., and contains the insects bearing those characters.

The corresponding drawers of the second, or "Beneficial" column, exhibit the species which are insectivorous in their habits, while the third comprises those which are neutral as regards agriculture, or of doubtful reputation. It is evident then, that this collection will be one of reference, and serve as a lexicon, or index to the economical entomology of the State: any person meeting with an insect with which he is unacquainted, can bring it hither, and readily find its name and habits; with these data, he can study the remedies prescribed by the various authorities, should it be injurious, or if otherwise, can extend to it at least a sort of negative protection. Among the contributors to this department during the year ending December 31, 1861, Mr. Emanuel Samuels has devoted a large amount of time to the subject, and presented many beautiful species, some of which are quite new and rare. Mr. Denis Murray has added a number of valuable specimens; and miscellaneous collections, at various times, have been received from Messrs. A. Jackson, O. J. Rand, L. L. Thaxter, J. G. Shute, T. C. Haskell, E. S. Rand, Jr., Hiram Barrus, Jas. Farnham, C. W. Jenks, H. Cowles, F. J. Kinney, Wm. Gregory, J. Hogan, and F. Whitcomb.

HARRIS ON INSECTS.

The preparation of "a new, enlarged and improved edition" of Dr. Harris's valuable treatise on "Insects Injurious to Vegetation," ordered by the legislature of 1859, has been completed, and the work has been issued in a manner generally admitted to be creditable, in the highest degree, to the Commonwealth.

The legislature made provision for placing a copy of the work in every town in the State, and also for the liberal offer of fifteen copies as premiums by each of the agricultural and horticultural societies. It will therefore be brought within the reach of most farmers who desire to possess it.

This valuable treatise cannot be too highly appreciated. Dr. Harris was regarded by the most distinguished scientific men in Europe as the highest authority in entomology, in the world, and the former editions of the work were admitted by the first entomologists, both in Europe and America, to be among the ablest and most valuable contributions to the science that had ever been made in any country or any language.

For accuracy, simplicity, and beauty of description, they were unsurpassed; nor has any work since appeared in any part of the world which can compare with this in practical value,

especially now that it is so fully, so perfectly, and so beautifully illustrated by the first living artists, under the direction of Prof. Agassiz, the first living naturalist.

The illustrations consist of nearly three hundred objects on wood, engraved in the highest style of the art, and in a manner pronounced "truly wonderful" by the most distinguished entomologists of this country, and nearly a hundred objects on steel, colored from life, by hand. These illustrations add vastly to the practical value of a work on this subject, by enabling the student or the practical man to identify specimens with accuracy and ease, which from a description, however perfect, would often be very difficult, and to a person not acquainted with the subject, attended with doubt and uncertainty.

It is a matter of congratulation, therefore, to the farmers and horticulturists of the State, that the work appears so thoroughly and beautifully illustrated.

I need hardly suggest to the agricultural and horticultural societies the importance of using great judgment and discrimination in making their awards of this liberal gift of the State. If judiciously placed, it will be the means of great good in leading to a higher knowledge of this interesting branch of natural history, on which our success in raising fruits and the other products of the farm so largely depends. Let it go, so far as possible, where it will be read and studied, where it will awaken interest and inquiry in the minds of the young, where its influence will be seen and felt, and where the objects of the legislature will be most surely attained.

MANUAL OF AGRICULTURE.

During the past year, also, the "Manual of Agriculture," prepared under the direction, and published under the sanction of the State Board of Agriculture, has been completed. It is a work of over three hundred pages, designed for the use of the more advanced classes in the public schools, and for the use of farmers generally.

It was not expected that this Manual would take the place of the elementary studies in the schools. Children under twelve years of age have enough to do in our ordinary system of instruction, in learning the essential elements of an education expressed in reading, spelling, writing, ciphering, &c.

This text-book was not designed to crowd out any of these studies, and for this reason it was not made so simple and elementary as it would have been if prepared for children of eight or ten years. But after the age of twelve or fourteen, if ordinary progress has been made in previous years, the youth is as well prepared to take up this text-book as he is to go into the study of grammar, ancient history, hygiene, or any of the other studies into which the advanced classes in our schools are put.

It should be borne in mind also, that it would be an important step gained in the education of the young, to give them a command of the terms which are of necessity used in reference to the sciences connected with agriculture, and which they must constantly meet with in after life. Any one who has grown up to the age of thirty or forty years without knowing the use and meaning of the terms oxygen, nitrogen, carbon, gluten, and a thousand similar ones, with their derivatives, finds it extremely difficult to get a clear and definite idea of them, or even to fix them in his mind ready for use as he meets them in reading. Now the young mind learns these terms with vastly greater readiness and precision, and in this respect has the advantage of a mature mind which had never been taught them in its early education. A well-educated lad of sixteen would probably find the Manual easier as a study than a man of forty who had never given attention to this or kindred studies.

So that if no other immediate advantage were to be gained, the mere acquisition of a familiarity with the terms in constant use would be of decided advantage, and of greater practical value through life than many of the studies of the young, which often have no practical bearing whatever.

It may well be doubted whether any text-book on agriculture or any of the sciences, however simple and elementary, could be judiciously placed in the hands of children under the age of twelve or thirteen years. If it is desirable to impart information and awaken an interest in natural objects, it can be done by oral instruction on the part of the parent or a competent teacher, but so far as any severe application goes, it is usually required for the rudiments of an education which must necessarily be general and form the basis and groundwork of after studies.

It is gratifying to be able to state, that the objects of the Board in the preparation of the Manual have been appreciated, and that many of the towns very promptly introduced it into their schools, and, so far as heard from, with uniformly satisfactory results.

Agriculture is the grand interest of this country: the greatest material interest of the civilized world. A knowledge of the principles which underlie all intelligent practice of this art is useful, not only to farmers but to men in all the walks of life. Is it not vastly more important to understand the nature and properties of the air we breathe, the water we drink, the soil on which we all depend for subsistence, and the best practical means of obtaining this subsistence, than to be able to solve a problem in equations, to name the rivers in Ethiopia and Siberia, or to become familiar with the isolated facts of ancient, or even modern history?

Hitherto the want of a suitable text-book, comprehensive in plan, simple in arrangement, and complete in execution, has presented an insuperable barrier to the successful introduction of the study of the practical sciences connected with agriculture into the common school. It was the purpose of the State Board of Agriculture to supply this want, and the Manual is offered as the means of laying the foundation of a valuable practical education.

After the most careful consideration of the Manual by the State Board, it was—

"*Resolved*, That this Board approve of the Manual of Agriculture submitted by its authors, Messrs. George B. Emerson and Charles L. Flint, and recommend its publication by these gentlemen, as a work well adapted for use in the schools of Massachusetts."

AGRICULTURAL STATISTICS.

Special attention is called to the Statistics of the Agriculture of the Commonwealth, at the end of the Abstract of the Returns of the Agricultural Societies. They have been compiled with great labor by Mr. GEORGE WINGATE CHASE, from the official returns of the eighth United States census, 1860, and from the returns of the assessors of towns, taken for the use of the valuation committee, *at the same time*,—*the collectors*

often meeting each other on their way, going over very nearly the same ground.

The returns of the United States census are grossly inaccurate, and untrustworthy from beginning to end, and afford a most unsatisfactory basis for forming a correct judgment of the present condition of the agriculture of the State; but the returns of the assessors, though themselves far from perfect, are more accurate and worthy of confidence, and afford a valuable means of correction in many cases.

The worthlessness of the United States census is probably owing to two prominent causes, which will vitiate this and every subsequent census till these causes are removed. The first, is the carelessness and apparent want of interest in making out the blanks at head-quarters, as if the inquiries were of no consequence. This arises, perhaps, in a great measure, from a well-founded conviction of the utter worthlessness of the returns when they are made, owing to the second cause, which is the manner in which the statistics are collected by the assistant United States marshals all over the country, who, one would suppose, are appointed wholly without reference to fitness for the work.

The immense patronage and the boundless political favoritism connected with this as well as other branches of the public service will probably ensure its continuance, or at least make it extremely difficult to break it up, and substitute some more efficient system in its place. But it would seem as if the statistics might be returned by the assessors of towns, the county commissioners, or, in cases where these officers do not exist, by the boards of supervisors of counties, or other officers chosen or appointed for their fitness to make these inquiries, in which case they would be worthy of greater confidence. Perfection is, of course, out of the question, but an approximation to accuracy is certainly attainable. A reference to the table on page 299 of the statistics, and the instances cited in the course of the remarks connected with them, together with innumerable other examples which might be stated, would lead to the belief that the returns of the eighth census cannot be regarded as even a remote approximation to the truth.

But imperfect as these statistics are, they are still the best we shall have for the next ten years, and, as such, are extremely

convenient for reference. As the same, or very similar faults extend over the whole, they are also valuable as a means of comparison between town and town, and as such they are worth being preserved for future use.

THE CATTLE DISEASE.

By a statement of the committee, on a preceding page, it will be perceived that the alarming disease among cattle, commonly called pleuro-pneumonia, has again appeared, during the past year, in some of the towns in the eastern part of the State. No one who candidly examines the history of its progress and development can longer doubt its contagious and fatal character, and it becomes those who are about to purchase stock to be exceedingly cautious to ascertain its past history, while those who own cattle would do well to keep them as strictly as possible from mingling with strange animals. The only perfect safety is in isolation.

The State has generously come forward again to attempt to arrest the progress of this fearful scourge, but the efforts of commissioners can be of little avail, without the coöperation of individual owners of stock. It is believed that with prompt and proper effort, the disease can be eradicated, but it will require much time and care, and every owner of stock should feel that he has a personal interest in such a result.

CHARLES L. FLINT,
Secretary of the State Board of Agriculture.

Boston, January 22, 1862.

REPORTS OF DELEGATES

APPOINTED TO VISIT THE

AGRICULTURAL EXHIBITIONS.

ESSEX.

The forty-fourth annual festival of the Essex County Agricultural Society, was held at the beautiful village of South Danvers on the 24th and 25th days of September—an exhibition every way worthy of the county—one of the oldest, most enterprising and populous in the State, and in manufactures and agricultural wealth, sustaining a high position. The weather was all that could be desired—beautiful autumnal days. As the delegate of the State Board I esteemed it a great privilege to be present; was welcomed very cordially, receiving every attention and courtesy, and having every facility furnished me for seeing and examining the exhibition in all its departments.

This county, which is the third in wealth and population in the State, containing five large cities, and many large towns and thriving villages, has but one agricultural society, while there are in six other counties, five of which are much less in wealth and population, from two to five societies each, thus dividing, and in a great measure destroying the agricultural interest.

This society has no permanent location, but holds its fairs in different sections of the county, thereby securing a greater attendance, accommodating every part of the county, and congregating the herds, flocks and products of a much larger territory than most societies. If it is owing to this itinerant system that the farmers of this county are united in one society,

is it not far better that it be continued, although there are many disadvantages attending it, than to be divided up into several smaller societies, of which we have already quite too many? I have ever supposed it necessary, in order to succeed well, that every agricultural society should have territory of its own, enclosed with suitable buildings and grounds sufficient for all its purposes, but since my visit to this large and prosperous society, I am free to confess at least to a modification of my feelings in this respect.

The exhibition of cattle was very creditable indeed, better than is usually seen at the fairs in the eastern part of the State. There were about eighty entries. Prominent among the thoroughbreds were the fine Jersey cattle of Richard S. Fay; the beautiful Ayrshires of Eben S. Poor and T. W. Peirce, and a white Short-horn bull from Indian Hill farm.

There were some fine Ayrshire and Jersey grade cattle, and a few yoke of good working oxen. Nearly fifty horses were exhibited; prominent among them was "Young St. Lawrence," which was much admired; a number of good draught and farm horses, and a fine display of mares and beautiful colts.

There were but two entries of sheep; Oxfordshire Downs from the stock of Richard S. Fay, and Cotswolds exhibited by Charles Corliss. Essex County, like the rest of the State has very little interest in sheep; it would seem that our farmers have yet to learn that a large proportion of the State is better adapted to sheep-husbandry than to any other purpose, and that the raising of sheep, whether for mutton or wool, is the best business that can engage their attention.

The exhibition of swine it would be hard to surpass at any fair in the State, either in numbers or in those essential qualities that make a perfect hog.

There was a very large and fine display of poultry. The dairy was well represented, and the bread and honey were not wanting.

Among the farm implements exhibited, Wood's mower was the object of general attention.

The fruits, flowers, domestic manufactures, fancy articles, works of art, &c., under the superintendence of Mr. Ives, were well arranged in the vestry of the South church. From the great scarcity of fruit this season, I was not prepared to see so fine a display of apples, pears and grapes. Of the latter there

were fifty-seven plates of the very best hardy varieties. Flowers in great profusion, perfection and variety.

In the department of domestic manufactures and fancy work, there was a great amount of well-wrought useful and ornamental articles, giving satisfactory evidence of the skill, good taste and industry of the ladies.

The show of vegetables was very large and of the best quality.

The ploughing match which is always a very interesting part of our agricultural exhibitions was on the morning of the second day. It was the best exhibition of the kind I ever attended, and was witnessed by a great multitude that no man could number. There were seventeen contestants for the premiums—eight double teams, four single teams of oxen, and five of horses. The whole affair was most admirably conducted, very quiet and orderly, every man going about his work as deliberately as if at home on his own farm, which is the natural consequence of not being limited in time; which is certainly to be approved.

Immediately after the ploughing, was the address by Hon. Alfred A. Abbott, in the midst of which I was obliged to leave, which I deeply regretted, for by so doing I not only lost a part of the address, in which I was much interested, but the dinner also, and more, the intellectual entertainment connected with it, and many other things that would have been very interesting to me.

SAMUEL H. BUSHNELL.

MIDDLESEX NORTH.

Pursuant to my appointment as a delegate from the State Board, I attended the show of the Middlesex North Agricultural Society, at Lowell, Thursday, September 12, 1861.

The day previous to the show was one of the stormiest of the season; it rained violently all day and until midnight, so that although the day of the exhibition opened clear and bright, the labors of the officers were much increased, and doubtless

many animals and articles which would otherwise have been entered did not appear.

I regretted the disagreeable weather also on another account, as preventing, what I had proposed, a ride over and a cursory view of some portions of the territory embraced by the charter of the society.

The exhibition was holden on the grounds of the society, within the city limits, which are of such an admirable character for the purpose, that notwithstanding the great rain of the day previous, they were perfectly dry and comfortable.

The grounds cover about fifteen acres, lying on an elevated sandy plain, costing originally $750; they are enclosed by a high, close, substantial board fence, costing $1,800; a hard, well graded track of half a mile in length, costing $1,200, is laid out, leaving a sufficient width for a free passage around; within this are the cattle pens, and the building, a large, commodious structure, laid out in the form of a cross, one hundred feet in length each way, and thirty-one feet in width, well lighted with gas; the southern wing is made into a comfortable tenement for the use of the superintendent of the grounds.

The ground floor is well arranged for the display of fruits, vegetables, and all manufactured articles; while the large, clear space of the hall above affords room for the dinner, the address, and a social gathering in the evening of "cattle-show day." The cost of the building was $3,300, besides $300 for gas and fixtures.

Payment of three dollars constitutes one a life-member, entitling him to a free ticket on the grounds with his wife and minor children, if he has them; all others pay twenty-five cents each. The fair is holden but one day, but with its receipts from the "levee" in the evening, and an exhibition of horses (not the society's) on the next day, the society takes about one thousand dollars.

If I were to make any suggestions to this well-managed society, one would be that they have material enough to occupy two days with their show. It is quite impossible for a person commencing at ten o'clock and leaving at one—the dinner hour—to see the ploughing match, the show of horses, the trial of working oxen and draught horses, the spading match, and to examine the stock with any thoroughness. I also venture the

suggestion that almost the only thing wanting in these well-planned premises, is a range of sheds sufficient to shelter the stock from the hot summer as well as from cold winds and rain; these might perhaps be made against the fence with a saving of expense; with these, and hay and straw furnished free by the society, I think the farmers from the more remote parts of the territory would be induced to drive down and enter their stock on the day previous; this would very much relieve the officers in their labors on the day of the show; the cattle would show a great deal better, and get home in better condition.

The ploughing match was actively contested by some half dozen teams in an old orchard which was hard enough to test the skill and patience of teams and men.

The exhibition of cattle was good; there were some fat cattle that would have done credit to any society's show, the milch cows were also superior. A very excellent Jersey bull of Dr. Bartlett, taken by him from the State Farm when a calf, received the first premium.

The working oxen, of which there were fifteen entries, were generally quick, strong, and well-trained, and performed the work well.

Of horses, one or two really fine stallions, several good roadsters, and a large number of fine colts were successively shown.

The sheep were rather ordinary, and there were few of them. It would have been gratifying to have seen, from the rich pastures of North Middlesex, a fuller representation of these most profitable and useful of all the domestic animals, which one would think might be kept to advantage, without interfering with the dairy business,—even if it did not improve it. I have very good authority for saying that the pastures of this district are deteriorating,—growing up to bushes and foul stuff, which cattle will not destroy, and sheep will,—and there is no doubt, at the present day, but that sheep improve pasture lands. The clear, cold and dry climate, and the rough, dry soil of New England are better adapted to the growing of sheep than almost any other section of country, here or abroad; that is, taking into consideration all the conditions which render sheep-husbandry profitable — their thriftiness, their freedom from all the worst diseases which infest the flocks of other countries, and of the richer, moister, warmer portions of this,

their fecundity, their capacity to bear, suckle and bring up many and large lambs, the superior quality of both the fleece and the flesh, and finally, what is of prime consequence, the proximity any where in New England to a market—which for mutton or lamb is always open, ready and more remunerative than for any other stock on the farm.

While sheep will live on a scanty supply of food—less, proportionately than any other animals—yet every farmer will find that a full quantity of good food, with an occasional change, and shelter from the wet, will amply repay in the increased quantity and quality of the wool.

While sheep can be well kept on good hay and good bright straw, a little grain, corn, oats or oil meal—cotton-seed meal perhaps the best—will most materially add to the thriftiness and good appearance of the animal, and ought to add very largely to the satisfaction of their feeder.

While roots are not indispensable yet an occasional feed of them will serve, as with any animal, to keep a healthy and open condition of the system.

It should be remembered, moreover, that the manure of sheep is to that of other farm-yard manure as 100 to 36; that with proper preparation of the yards and sheds both liquid and solid manure are saved; and, also, that every bushel of grain fed improves the quality of the manure.

For the eastern part of this State the Down sheep will be found the most profitable in the production of lambs and mutton, while their wool—which for years has gradually been growing in demand—now commands a higher price than even the splendid Merinos of Berkshire.

The swine were remarkably good, of very large size, fine bone, and good sides, a feature often unregarded. The Mackay blood seemed to predominate—and a most excellent strain of hog-blood it is.

A long line of poultry coops, well stocked, attracted much attention.

I also noticed a caged fox, and some other animals not strictly agricultural, which I mention that although apparently out of place, yet may be favorably regarded. Such things as rabbits, Guinea pigs, and an ass, commonly entered by farmer's boys,—who, in the fulness of pride over their pets, beg to be allowed,

as the only contribution they can make, to take them to "cattle show;" they are pleased at the attention they receive from strangers, and gratified at being noticed; and return home proud and happy in the success of the day, and with an interest excited which will develop at future exhibitions in the legitimate articles of the cattle show.

In the hall the show of manufactured articles of all kinds was splendid; the products of Lowell looms, and the handiwork of Middlesex women, were finely displayed.

The fruit and the vegetables were uncommonly fine,—unsurpassed by any display of those articles in any county of the State that I have seen.

There were seventeen entries of butter, which sustained the dairy reputation of this part of the State.

A large amount of bread puzzled the tastes of the committee.

An eloquent oration by Dr. Loring followed the dinner, at one o'clock, in the upper hall, after which the time was beguiled with short speeches and sentiments, with music from the band.

The delegate responded to a complimentary sentiment proposed to the State Board of Agriculture.

The show was a good one, and passed off in a most satisfactory manner, reflecting great credit upon the officers of the society. I did not notice a single instance of drunkenness or disturbance of any kind.

This society probably owes its existence to the activity of the Chelmsford Farmers' Club, formed some years ago, and is an example of the usefulness of Farmers' Clubs.

The territory included in the North Middlesex Society covers twelve towns, with naturally an unfertile soil, and a portion of that which would be the richest made almost worthless by stagnant water set back from milldams, that thus destroy more than the value of the mills upon them; this is a grievance that calls loudly for redress.

The vicinity of this society to Boston and the great manufacturing towns and villages that have sprung up in and near it, have effected a complete change in the course of farming.

By the lines of railroad covering the county, and passing through every town but one in the society, ready transportation is afforded for all the perishable farm products, and every farm is near a market.

Within the past twenty years there has been an immense increase in the dairy products, from $51,000 to over $110,000; this has been mostly in milk, the annual reported sale of which amounts to $71,219, much of which goes by rail to Boston and Lowell.

A very large amount of "garden stuff" is in the same way marketed, which does not appear in the returns.

Fruit has just about doubled in amount, being now $66,302 against $33,512 in 1845.

These changes appear as strongly in the numbers of the domestic animals. More milch cows are kept and fewer working oxen; fewer cattle are fed for beef, more horses are worked and driven. The horses are now 2,649 against 1,782. In 1840 there were over 2,000 sheep, which with the wool were worth $6,000; now there are 460.

Probably there is a much higher state of cultivation now than formerly, great quantities of manure and fertilizing substances are taken from the towns and villages on to the farms, which more than supply the loss of what is carried away. As the soils lying on micaceous and other slates usually prove the best grazing and grass lands, we find that those towns making the largest dairy products are largely on that geological formation. Burlington, a small town almost wholly slate, sends $18,500 worth of milk and butter; Westford, with almost $20,000 worth of dairy products is half on slate, so with Chelmsford, Tyngsborough and Dracut. A noticeable fact is, that while the value of all the cows and heifers in this territory is $145,894, those of their products which are sold off the farm amount to $110,674; now, adding to this last sum the amount consumed at home, and deducting from the first sum the value of the heifers which give no milk, it would show an equalization of the figures, proving the profitableness of dairy farming there.

The crop of Indian corn has been very largely increased there, being 72,000 bushels grown, and of hay 17,366 tons of all kinds; but as there are to be fed during a term of not less than 150 days 7,469 head of neat stock, and 2,649 horses, being in all 10,118, to say nothing of their 460 sheep, it would seem as if the farmers there would have to import feed to see them through the winter.

These facts and figures are perhaps of no great usefulness; but it may be interesting for farmers in other parts of the State to know how their brothers manage in the east.

The North Middlesex Society is, I believe, well managed by its officers, well sustained by other as well as the farming part of the population, and is well worthy the patronage of the State—which is not wasted or misapplied.

JAMES S. GRENNELL.

MIDDLESEX SOUTH SOCIETY.

The exhibition of the Middlesex South Society was held at Framingham on the 17th and 18th of September.

It is evident that the members of the association have lost none of that enterprise and interest in its welfare which have made it one of the most flourishing societies in the State. It is well known that within the limits of its organization are some of the most energetic and successful importers and breeders of cattle among us, and many evidences of their care and skill were seen on the grounds. The Devons of Mr. Buckminster, the Ayrshires of Mr. Peters, and the Short-horns of Mr. White, are too well known to need comment. There can be no doubt that with opportunities such as these gentlemen afford, the farmers of Middlesex will soon learn what class of animals are best adapted to the dairy purposes for which their farms are fitted.

The exhibition of sheep was very creditable, and evinced a determination to give these animals the chances which they deserve, as part of our farm stock. Some portions of the land within the limits of the society are capable of carrying heavy sheep, and the efforts made by Mr. White and Mr. Wheeler of Framingham to introduce them are deserving of encouragement.

The swine were very superior. An infusion of Suffolk blood had given them a compactness and evenness which is very desirable. It was observed, moreover, that by the use of Mackay boars in some instances, and in others of Chester County boars, the size and capacity of the animal had been

largely increased. There seems to be but little doubt that the Chester Counties crossed upon well shaped sows of smaller breed, such as the Suffolks, produce the best hog for the farmer. This cross is highly recommended.

The specimens of Blackhawk, Balrownie, and other breeds of horses were very fine, and the large number of stallions, breeding mares, colts, farm horses, pairs of horses, and workers, entered for premium, indicated a laudable interest in this branch of farming.

To speak in a complimentary manner of the poultry exhibited by Mr. Felch, of Natick, is to do no more than justice to an enterprising laborer in this part of agriculture.

The show of articles in the hall was large and well arranged. It was gratifying to see the specimens of corn and other grain for which the soil of this region is so appropriate. The cultivation of wheat has received much attention from members of this society, and we trust it will not be abandoned.

Of the fruit, the culture of the grape seemed to have been carried to a high degree, and attended with great success. An entry of two peach orchards for premium showed an enterprise in the midst of obstacles, worthy of praise, and perhaps in the warm lands of South Middlesex, destined to succeed.

A premium for handwriting brought out two competitors; and as an encouragement to the sons of farmers to cultivate this important branch of education, it might well be repeated elsewhere.

The society seems to be in very successful operation, if we may judge from the interest manifested in the various objects exhibited. The ploughing match was well attended, and was conducted with spirit and good order. The grounds were thronged with people. The hall was crowded, and an attentive audience took part in the proceedings of the day. The whole amount of receipts for the last year are eleven hundred and twenty-four dollars and fifty cents. The premium list is liberal, the amount awarded being six hundred and forty-two dollars and seventy cents. It is to be hoped that nothing will check the zeal hitherto displayed in the exhibitions of this society, as it is evident that among its members and within its jurisdiction are many skilful and prosperous farmers, occupied in almost

every branch of agriculture,—the dairy, the orchard, the garden, the fold, the stable, the field, and the pasture.

GEORGE B. LORING.

WORCESTER.

On the nineteenth day of September I attended the exhibition of the Worcester County Agricultural Society as the delegate from this Board.

This being my first visit to the annual show at Worcester, my expectations were highly raised in regard to what could be exhibited by one of the oldest and largest societies in the Commonwealth. Judging of this show by comparison with what I have been accustomed to note upon most such occasions, I should not hesitate to admit that I was disappointed in my expectations. But I am aware that it is to be looked upon, not as a general agricultural exhibition where extensive competition is manifested in all the branches of agriculture, where large collections of vegetables occupy long ranges of tables, and luscious fruits tempt the eye and appetite by their rich and varied colors. I soon became convinced that I must consider it as a cattle show, *per se*, and in this department, I think it would be difficult to furnish a superior in the State.

Large numbers of blood cattle were exhibited, many of them indicating purity and careful breeding, while some entered as pure and undoubtedly thought to be so by their exhibitors, showed in various ways the traces of other breeds, while at the same time I should, for profitable animals to retain upon a farm, have been quite as ready to select from the various grades as from the pure stock. I should infer that it was customary among the farmers of Worcester County to use bulls at a more advanced age than is usually regarded as profitable by most breeders, as I noticed several specimens entered for premium at the age of five years and some months.

In the eastern part of the State, it would be difficult to dispose of a bull, except to the butcher, which had passed the age of three years. Whether the feeling against older bulls is based

upon sufficient experience, or is only prejudice, I have much doubt. In one point of view it would undoubtedly be better to change the bull at an earlier age than three years. The doctrine which teaches us to breed "in and in" in families has not met with much favor in this country. Hence to avoid the incestuous process which allows a bull to sire calves by his own progeny, the bull must be changed as often as every third year.

The ploughing match was well contested, and excited its usual interest. The work was creditably performed and without undue noise or severe urging of teams.

Upon looking through the exhibition hall, I was much surprised to find but a single exhibitor of fruit; the specimens comprising nine varieties of apples, some of which were without any distinctive name.

Being unable to explain this deficiency by the general failure of the fruit crop, I found that no premiums upon fruit had been offered, as it was supposed that the exhibition of fruit by the Worcester Horticultural Society had lessened the interest of the public in this portion of the county show. The most prominent and attractive feature of the indoors exhibition was a large and beautiful exhibition of hot-house plants, occupying nearly one end of the hall, and without which very little worth attention would have been found in the building.

The exhibition of butter was large, but the specimens did not present as good a color, nor as careful preparation as I have seen elsewhere. Whether the color was owing to the breed of cattle, or the character of the pastures which produced it, I was unable to learn. But little apparent interest appeared to be felt by the people of the city proper in the show, and I do not know but this is customary; all the persons, however, with whom I conversed both upon the grounds and in the city seemed unanimous in the opinion that the show of the 19th was of little importance in comparison with the horse show of the 20th, at which all (including the officers of the society) predicted a much larger attendance. My engagements, however, harmonizing with my inclinations, I did not remain to witness this great feature of the Worcester County exhibition, and I left the ground with the hope that the Worcester society had not reached that condition which was described in a report made to

this Board in the year 1856, "as the simple spirit of a jockey, although an unconscious one," which this Board and the societies patronized by the State should do all that in them lies to correct.

JOHN C. BARTLETT.

WORCESTER WEST.

The fair of the Worcester West Agricultural Society having been postponed one week on account of the National Fast, was held at Barre, on Wednesday, October 2, 1861. By appointment from the State Board, I attended this fair as delegate to the association. The weather being delightful, the attendance was large, and the exhibition entirely successful. The noble old farms of Barre and vicinity sent forth representatives of the finest herds of cattle to be found in the State. The collection especially of fat cattle, was very large, and attracted much attention. The big oxen of Messrs. Tucker and Reynolds, weighing 4,930 pounds, and exceedingly fat, were much admired. The show of horses was good, and embraced many fine animals; among them was the celebrated young stallion, "George M. Patchen, Jr.," owned by B. D. Godfrey, Esq., of Milford.

The exhibition at the Town Hall was, taken as a whole, very superior, especially in dairy products, which was quite large, and the butter and cheese there exhibited would do honor to any show in the State.

The exhibition of manufactured articles was quite fair, and some of the agricultural implements of recent invention, the hay-spreader, exhibited by Mr. E. W. Bullard, in particular, deserves a place in the tool-house of every farmer.

The dinner and the social entertainment which followed was evidently enjoyed by all present. It is to be regretted that this society holds its fair but one day, as the time afforded for the examination of so many different specimens is too limited for a thorough examination of each article.

By the politeness of Willard Broad, Esq., I was enabled to visit several of the splendid farms in this part of Worcester County, and it afforded me much pleasure to notice the many

improvements that are now being carried on in this important section of our old Commonwealth, and I returned to my own home more thoroughly convinced than ever before that the aid Massachusetts is bestowing on her agricultural interest is yielding a golden harvest for the present generation, and will be more fully realized by those that may come after us.

HENRY CHAPIN.

WORCESTER NORTH.

The Worcester North Agricultural Society held its Ninth Cattle Show and Fair at Fitchburg, on Tuesday and Wednesday, the 24th and 25th of September.

The exhibition at the Town Hall was opened at 6, P. M., of Tuesday, where there was a good show of manufactured and fancy articles, and paintings, of bread, butter, cheese, honey, and pickles; and the largest and best assortment of potatoes and squashes which I have ever seen. In other vegetables there was nothing extra which came to my notice. The display of grapes was very good, but of other fruits very meagre. Every thing in the hall was well arranged, and the tables were decorated with an abundance of choice flowers.

Dr. A. Hitchcock exhibited a well-prepared skeleton of a fine horse, which had been killed in consequence of having broken the right H bone, showing the progress which nature had made in repairing the injury.

A glee club entertained the large audience with most excellent music, and all present seemed to enjoy themselves.

The weather of the 25th was exceedingly pleasant. The show of neat stock was very large and excellent, including Devons, Durhams, Alderneys and grades. The show of breeding horses and colts, of swine, poultry and sheep, was large and good.

The ploughing and spading matches, and rock lifting, upon the farm of Lyman Nichols, Esq., were witnessed by a multitude of people, and seemed to be the most attractive features of the show. It was exceedingly gratifying to me to witness the

results of the indomitable energy and perseverance of Mr. Nichols, in making the rough places of his farm smooth, and causing not only two blades of grass to grow where but one grew before, but in causing tons of vegetation to grow where nothing but stones were visible before. His example to the farmers around him must be of great value, and I trust that he will receive a rich reward for the amount of his investments.

At one o'clock, the society and invited guests sat down to an excellent dinner, which had been prepared by Colonel Day, at the Fitchburg Hotel, and which was eaten with apparent relish, without grace, speech, sentiment, song or wine. After the dinner, they met in the lower town hall, to hear the awards, and eloquent words from the President, Colonel Thomas Billings, the Hon. A. H. Bullock, of Worcester, and others.

Resolutions offered by J. T. Everett, Esq., of Princeton, awarding due meed of praise to the State Commissioners, Hon. Amasa Walker, of North Brookfield, Dr. G. B. Loring, of Salem, and Hon. Paoli Lathrop, of South Hadley, for their wise, prompt, and successful labors in extirpating the cattle disease or pleuro-pneumonia from the State, were adopted.

The show was highly successful in all its parts.

I was requested while there, not to "hide the faults" which I might see, but to report them; and in accordance with that request, must say that I consider it a great fault for a society so full of life and energy, and so abundantly able as is that of Worcester North, to have no place of its own on which to have its exhibition; having to show its stock in the public square, and hold its ploughing match on borrowed ground a mile distant; and what is still worse, to be subject to competition with the "Fitchburg Riding Park," which advertised on the same day of the fair to have two trotting matches, one for a purse of $100, and another for $50, which, according to the newspaper reports, were witnessed by a large number of people. So long as men are willing to give even a "kingdom for a horse," it is of but little use to attempt to beat them in a race with oxen; and whoever tries it may be sure of being distanced.

I am indebted to the President, Colonel Thomas Billings, Hon. Jabez Fisher and family, and other officers of the society, for kind attentions, making my visit exceedingly pleasant.

E. W. Gardner.

WORCESTER SOUTH.

The annual Exhibition and Market Fair of the Worcester South Agricultural Society were held on the 3d and 4th days of October, at Sturbridge. The weather was delightful; and, with the exception of a more limited display of fruit and a less number of town teams than usual, the exhibition was the most successful ever held by the society.

The attendance on the first day was large, probably twice as large as at any former show of the society.

The pens—40 in number—were filled with cattle, horses, sheep and swine, of a character by no means inferior to any in the county, if we except, perhaps, the Durham cattle of some parts in regard to size.

There were entered for premiums 8 working oxen, 7 steers, 5 herds of cattle, 14 cows and heifers, 14 bulls and 3 fat cattle. These were mostly Durham, Devon and Ayrshire grades, but there were several very fine thoroughbred bulls, cows and heifers, especially of the Ayrshire breed.

Of sheep there were 13 entries for prizes, of swine 14, of poultry 10, all rare specimens of their kind. It hazards nothing to say that the swine cannot be surpassed in the State.

The ploughing match was nobly contested by 15 competitors, with 11 ox and 4 horse teams, upon a soil well suited to test the power of the teams and the skill of the ploughmen. It was a stiff and rather close soil, ploughed 7 inches deep and in a masterly manner.

There were 15 competitors for the prizes offered for drawing and backing with oxen and steers on the cart. The load for oxen was 3,000 lbs., for steers 1,000 lbs. The trial took place on an elevation lying at an angle of about 15 degrees. The work was well done, and in a quiet and orderly manner.

It is sometimes painful to witness, at the trials of the powers of working oxen, the constant and cruel application of the whip; but it is due to the teamsters on this occasion to say, that their teams appeared to do all they were capable of doing without an undue application of that instrument of torture.

The society's hall never before presented a scene so grand and beautiful. The walls were decorated with a profusion of flowers; with the numerous articles, both useful and orna-

mental, contributed by the ladies; with samples of grain; the smaller vegetables; paintings, drawings, specimens of penmanship, and curiosities of various descriptions. The tables were laden with manufactured articles, too numerous to mention; with fruits of fine appearance, though limited in quantity; with vegetables of mammoth size and excellent quality; with butter, cheese, bread, pickles, preserves, wine and honey. The spaces between the tables were packed with visitors through the day.

Of the vast number of articles exhibited in the hall, only the following were entered with the secretary for premiums: butter, 13 specimens; cheese, 10; manufactured articles, 7; horticulture and floriculture, 24; fruit, 15; needle and ornamental work, by ladies, 38.

Several squashes were shown weighing from 40 lbs. to 100 lbs. each, and pumpkins, melons, roots, &c., of great size and beauty. One gentleman contributed 18 pumpkins, the produce of one seed, all perfectly ripe, of medium and about equal size, still adhering to the vine on which they grew.

The amount received for tickets of admission to the hall was $174.03. Members of the society were admitted free.

At one o'clock as many ladies and gentlemen as could be seated at table in the Town Hall partook of an excellent dinner prepared by F. O. Wallis, Esq., keeper of the hotel, in his best style.

The show of horses was excellent; 39 were entered for premiums, including studs, breeding mares, colts, &c. Nine carriage horses, all noble animals, appeared for prizes, and performed, in fine style, several times around the Green.

At the announcement of the cavalcade the people gathered in large numbers to witness the performance, and every nook and corner that would afford a view of the show ground was immediately occupied. The cavalcade consisted of 21 couples, mounted on elegant horses, and held the attention of the delighted crowd for a full hour. It was truly a fine display, decidedly the most attractive feature of the show.

The ladies rode gracefully, and managed their horses quite skilfully.

On the second day came the Market Fair, which opened at nine in the morning, to continue through the day. At ten o'clock a

discussion at the church, at twelve o'clock the reading of the reports of the committees, at one a dinner at the hotel.

Very little was done at the fair. Only one ox and forty sheep changed owners during the day.

The subjects for discussion were—first, Is it expedient to offer premiums on distinctive field crops? second, Which is the most profitable crop to raise?

The affirmative of the first question was taken by Henry Hitchcock, Esq., of Sturbridge; the negative by Franklin Lincoln, Esq., of Brimfield, and both sides were ably discussed. The second question was argued at length by Dr. Samuel Hartwell of Southbridge, A. P. Avery, Esq., of Fiskdale, Rev. Dr. Waterman of Spencer, and others. The discussion was spirited, and elicited useful hints and valuable suggestions. The speakers on the last question strongly inclined to the opinion that Indian corn is the most profitable crop to raise.

The reading of the reports was next in order; after which the company proceeded in procession, with music, to the hotel, where they partook of an excellent dinner; and this was the closing performance of the seventh annual exhibition of the Worcester South Agricultural Society.

This society is in a flourishing condition. Its fund is gradually increasing with the increase of members, and a deeper interest in the cause of agriculture generally, and in the affairs of the society in particular, was never more manifest than at the present time.

O. C. Felton.

WORCESTER SOUTH-EAST.

The annual Agricultural Fair and Cattle Show of the Worcester South-East Society, held at Milford, came off, according to previous announcement, October 8th and 9th. The weather on Tuesday was unpleasant, being somewhat rainy, but Wednesday was fair and all that could be desired. The attendance the first day was not large, being chiefly limited to persons bringing articles and stock for exhibition. I attended only the first day, as I had other business, and could see every thing on Tuesday

(except the ploughing-match) which was really the Fair day —Wednesday being taken up mostly with processions, speeches and dinners, and, as I am credibly informed, and do not doubt from indications on Tuesday, was all that the members and friends could desire.

The show of neat stock was creditable as to numbers, there being eighty entries for premiums, and a few very good ones; but, as a general thing, the cattle were inferior; and I think the farmers in this vicinity need to take more pains with their stock, in order to secure the largest profit in that branch of agricultural business.

The show of horses was small, comprising some twenty-five to thirty entries of all classes. There were a few excellent specimens,—two superior young stallions, one sired by Patchem, the other by Ethan Allen, were of great promise.

The horse show came off in the street and was, in consequence, a somewhat irregular affair. I would recommend to this society to procure grounds and a track if they wish to succeed in their show of horses and cattle.

Of swine there were twenty-six entries, the show of which was superior to that of most societies of which I have any acquaintance. The Chester County breed were largely represented. I think they find it pays to improve their hogs, and hope they will try the experiment with their cattle.

I saw no sheep on exhibition, a thing which much surprised me, as I should think, from the surface of the country and the nature of the soil, together with the excellent home market, it was just the place for raising lambs for mutton; in fact for some mysterious reason there seems to be a scarcity of this profitable animal throughout the eastern portion of the State, which very much surprises me, as they are the easiest stock to raise, and multiply the fastest, and come to maturity the quickest of any of our domestic animals. I think the people ought to have Grennell's Report on Sheep more thoroughly circulated among them.

Of live fowls there were thirteen entries, comprising hens, turkeys and geese.

The show in the hall was the great success of the Fair, and to which, apparently, the greatest attention was paid, and it was really a superb affair. The ladies connected with the Fair

deserve especial praise for their efforts to make it attractive: together with our worthy friend, the delegate from that society, who had more than he could well attend to in directing the arrangement of the hall,—and if he did not do more than one thing at a time, was at least trying hard to.

The ladies not only brought abundant specimens of their handiwork for competition, but spared no pains to decorate the hall for the occasion.

Of garden vegetables there were three hundred and forty-seven entries, comprising numerous varieties; and for quantity and quality I have never seen them equalled at any thing short of a State Fair.

Dairy products entered consisted of twelve specimens, of good quality.

Grain crops, thirteen entries; root crops, thirteen; and bread, twenty-two entries.

I was quite surprised at the display of fruit, considering the season. The entries of apples were one hundred and nineteen; pears, sixty-four; grapes, twenty-seven; peaches, only one.

Of honeys, jellies and wines, forty-eight entries; agricultural implements, and other manufactured articles, thirty-eight; straw braids and bonnets, seven; pictures, paintings and drawings, nineteen; dentistry, one.

Of flowers there were fourteen different entries, comprising, in the case of one contributor, over two hundred and fifty different varieties. Flowers were wrought into splendid bouquets to adorn the hall,—to gladden the eyes and cheer the hearts of the visitors. The thanks of the society are due to the contributors for this beautiful display.

Decorations of the hall, sixty-seven entries; domestic manufactures and fancy articles, one hundred and seventy-three entries. The whole were tastefully arranged, and made one of the best exhibitions I have ever witnessed.

In conclusion, I would acknowledge the cordial welcome extended to me by the officers and members of the society, and the generous hospitality of the president, Hon. A. C. Mayhew.

MATTHEW SMITH.

HAMPSHIRE, FRANKLIN AND HAMPDEN.

Forty-three consecutive years the Hampshire, Franklin and Hampden Agricultural Society has held its annual fair.

It met this year, on an occasion of more than usual interest. For the first time since its organization was the entire exhibition concentrated upon their own grounds. About five years ago the society purchased (at an expense of four thousand dollars) sixteen acres of land, beautifully located in the fertile Valley of the Connecticut; and here, during the past year, they have erected a commodious building, one hundred and eight feet long by forty feet wide, which contains two large halls with suitable ante-rooms, at the cost of about three thousand dollars.

On Thursday and Friday, the third and fourth of October, I had the pleasure of meeting a large concourse of the ardent friends of agriculture from this portion of our State. Each day, by its sweet and balmy air, seemed to add joy and gladness to the occasion.

Although it appears that this society should embrace three counties, yet, by inquiry, I found that the contributors were almost entirely confined to the county of Hampshire.

I wish I was able to compare the exhibition of this year with those of past years. From what I could learn, however, I should judge that the expectations of its most ardent friends were fully realized. Those who have heretofore opposed the onward progress of the society, in the erection of a building, had to confess their disappointment. It is to be regretted that the society's grounds are so limited in their extent; instead of sixteen acres, the wants of this society need at least thirty acres. It is to be hoped that those who own adjoining lands will fully realize this *need*, and with their accustomed liberality make provision to meet this want.

There is nothing so important in the exhibition of stock as space, and you can well imagine how closely we were brought together, when provision was made for the numerous mowing machines in full play, peddlers' carts, refreshment tents, and numerous other places of entertainment.

The ploughing, a very important and interesting part of our agricultural fairs, was entirely omitted.

With the enlargement of grounds, this society would be surpassed in its accommodations by no other in our State.

Surely, none has a locality in a more fertile spot. Those rich bottom lands bordering on the waters of the Connecticut should be made the model garden of our State. I fear that the remark is too true—the sons are not disposed to profit on the experience of their fathers—that acres of their most valuable land are left like a barren waste, and if cultivated, the crop must depend more upon the richness of the soil than careful and thorough tillage; lands valued at three hundred dollars per acre, producing not more than forty-five bushels of corn to the same.

These remarks are not applicable to all the farmers within the bounds of this society. There are farms worthy of note, where thorns and briars find no home; and as evidence of this, we are glad to note some of the prominent points in this exhibition.

The display in the hall fully demonstrated what could be done. Vegetables, in great variety and abundance; fruits and flowers, very fine and beautifully arranged—showing the skill and workmanship of the ladies of Hampshire: the whole display calculated to please the eye and gratify the taste, for the wine and the honey were there.

I was disappointed in finding no more specimens of wheat. The soil and climate must be favorable, in this section of our State, to the production of this article; and I find, in the census of 1850, that the county of Hampshire alone produced about five thousand bushels. I think, on examination, it will be found that no crop would yield a better profit, unless it be tobacco, an article neither useful for man nor beast. And here permit me to inquire, why it was that no specimen of this article found a place at this fair? Are its producers ashamed to place it beside the other products of the earth?

The exhibition of cattle occupied a large part of the first day. Some of the finest in our State are found in this society.

The name of Lathrop brings with it an array of those beautiful Durhams, *unsurpassed*, and yet not without much care and attention. It is quite evident that many of the farmers of this county take great pride in the raising of stock, as the excellent display on this occasion fully corroborated.

Another feature in the exhibition was the address, on the afternoon of the first day. The design of the speaker was to dwell upon the different modes of farming, and especially to urge upon his hearers the importance of the use of machines in the cultivation of the soil. He cautioned them to beware of those "*traps*," the agricultural warehouses, preferring that every man should be his own mechanic and build his own machine.

The address was well designed, but altogether out of time and place. The audience was large at the opening, but before the close the hall was almost deserted. Most people who assemble on such occasions are very impatient under long speeches, and I have often thought that an address would be more profitable could it be delivered at some other time and in a more quiet place.

The second day was almost entirely devoted to the exhibition of horses.

The number on exhibition were quite numerous, and among which were many fine specimens. It is interesting to witness the great enthusiasm manifest when we come to this department in our agricultural fairs.

I am pleased to state that on this occasion every thing was admirably conducted; the qualities of this noble animal were fully shown without resorting to excessive driving. The occasion was closed with a sumptuous dinner, well seasoned by a congratulatory speech from the worthy president.

NATHAN DURFEE.

HAMPSHIRE.

The twelfth annual cattle show and fair of the Hampshire Agricultural Society was held on its grounds, at Amherst, on the 10th and 11th days of October last. The weather during both days was most unpropitious. The forenoon of the first was cold, cloudy, and threatening of storm. As a consequence the attendance of farmers was comparatively small, and the entries of the different kinds of stock considerably diminished. Nevertheless the show was respectable.

There were on the ground, of neat stock, seven bulls—one of them the Durham bull "Holyoke," owned by the Hadley Farmers' Club; seven cows, comprising two beautiful Ayrshires imported by Mr. Sweetser, of Amherst; fourteen heifers; five pairs of fat cattle—one pair of Durhams weighing 4,080 lbs., and one of native stock weighing 3,850 lbs.; twenty yoke of working oxen; seven yoke of three, and four yoke of two years old steers; and twenty-three calves.

There were several entries of swine, chiefly of the Chester County breed. Noticeable among these was one lot of Chester County stock, twenty-three in number, presented by Mr. Kellogg, of Chicopee. One of these was a two year old, weighing, by estimation, 600 lbs.

There were five or six entries of sheep—nearly all of the coarse-wool breeds; among them was a fine buck presented as a full-blood South Down by Mr. Hubbard, of Sunderland.

The second day brought a continued, and much of the time, a drenching rain. It was devoted to the exhibition of horses. The number of animals was much smaller than a more favorable day would have called forth. Seven stallions, six brood mares, twenty-five colts, three trotting nags, six pair of carriage and eleven of farm horses, comprised the number entered. Many of these animals were worthy of special commendation. A pair of Morgan mares, weighing 2,200 lbs., which drew with apparent ease, on a loose and sandy soil, a load of 4,800 lbs. weight, and nine men added, attracted no little attention.

Another noticeable feature of the exhibition on both days was trials both of strength and speed by young men belonging to the gymnastic class in Amherst College, and by others under the direction of Dr. E. Hitchcock, Jr.

The commodious building on the grounds of the society, with its large exhibition and audience halls, naturally, under the circumstances, presented the chief attractions of the fair.

Here were shown numerous and excellent specimens of butter, cheese, and honey; of fruit, several collections comprising many varieties; and many single entries of apples, pears, grapes, quinces, and cranberries; also a good show of wheat, corn, rye, buckwheat, onions, &c., together with twenty specimens of wheat bread, fifteen of rye and six of brown bread.

There was also a good variety of the products of mechanical industry and skill; and specimens of the tasteful handiwork of the ladies, too numerous to mention.

On the afternoon of the first day the members of the society listened, in their audience hall, with evident interest and profit to an able address by ex-Governor Washburn, of which it is enough to say, that it was worthy of the occasion, and of the man, whose voice and pen have never failed to do willing and effective service in the cause of agriculture. On the afternoon of the second day, they sat down to an excellent dinner, in the same hall, which was followed by an amusing and worthy poem by Mr. Dyer, a recent graduate of the college and by short and decidedly patriotic speeches from President Stearns and several others.

The popular president of the society, Professor Clark, now Major in the twenty-first regiment of Massachusetts Volunteers —not forgetting in the din and excitement of the camp and the field the interests of agriculture, which he cherishes so heartily and serves so well—having returned on a furlough for that purpose—presided over the various exercises of the society with his wonted spirit and vigor to the great gratification of his friends and associates.

J. WHITE.

HIGHLAND SOCIETY.

The annual exhibition of the Highland Society was held at the grounds of the society, in Middlefield, September 12th and 13th. In a financial point of view, this association has been conducted with economy and skill; and after having enclosed the grounds, presented by Matthew Smith, Esq., and paid for the hall, erected in 1859, it is free from debt, and is enabled to make liberal offers of premiums. The elevated location of the land devoted to the exhibition presents a commanding view of this section of the State, occupied by some of our finest grazing farms. And the towns of Middlefield, Becket, Chester, Hinsdale, Washington, Peru and Worthington furnish liberal contributions to the annual shows.

The quality of the cattle was one of the most marked features of the exhibition, and illustrated, very strikingly, the

comparative merits of some of the well-known breeds. Among the three hundred head on the grounds, by far the largest number was composed of grade Short-horns, bred in this region since 1840, commencing with a bull of the Rensselaer stock, and followed by Americus, Roan Duke, and other animals from the herd of Mr. Lathrop, and that of Mr. Thorne. It was evident from the size and shape of the stock exhibited, that great care had been taken in the selection of the males. Better specimens of this blood are seldom seen, than could be found in the steers from two to four years old—a pair of the latter belonging to Mr. Charles Bill, weighing 4,500 pounds, and a steer two years old belonging to Matthew Smith, weighing 1,800 pounds. This breed of cattle in and around Middlefield, has attracted the attention of the feeders of the Connecticut Valley and elsewhere; and very considerable profit has accrued to those who are engaged in breeding them.

The exhibition of Devons was small. They were of fine quality however, well muscled, heavy quartered, thrifty animals, mostly descended from the bull "Winchester," owned by Mr. Harlow Loveland.

A few specimens of Ayrshires were exhibited, among which were the grades of B. F. Peirce, of Peru, who has a pure bred bull descended from the stock of Mr. Barrett, of Concord. The heifers exhibited by Mr. Peirce were fine specimens of the grades of this breed, and seemed to be admirably adapted for the dairy herd on these highland pastures. The Ayrshire bull of Ebenezer Peirce, of Peru, sired by "Essex," attracted much attention and is a valuable animal.

There were twelve entries of sheep, mostly fine-woolled—some Oxford Downs and a few South Downs. As is usual in the largest sheep-grazing sections of New England, the fine-woolled sheep is here most popular with the farmers, and is said by them to be the most profitable. The importance of introducing sheep into Massachusetts is so great that the comparative profits of fine and coarse-woolled, seems to be a secondary consideration, and a question which may be decided when our pastures are once more occupied by this useful animal.

Of swine there were but few, and they mostly Suffolks crossed upon a coarser breed, with here and there a Chester County.

The second day was devoted to an exhibition of horses, of which the entries were numerous. Most of the animals were remarkable for good size, and strength, and bone; and were of the various families of Morgan. J. W. Wheeler, of Becket, exhibited four two years old Blackhawk colts of very superior excellence, all sired by the horse "Berkshire." He also exhibited an Ethan Allen and a Stockbridge Chief, both three years old. Five Morgan stallions were also exhibited by Mr. Baird, of Becket, and Mr. Johnson, of Chester. All these horses evinced careful attention to the breeding of that kind of animal so much in demand among us for the road and for draught.

The hall contained a fine display of crops and articles of domestic manufacture, evidently from farmers' families.

An address in the village church, and a very interesting distribution of silver ware among those who were entitled to premiums, closed the exhibition.

In visiting the farms in this section, it appeared that there was a preponderance of pasturage over the products of tillage land; and that the farmers had not fully stocked their pastures, on account of an insufficiency of winter feed. As the land and seasons here are not well adapted to corn, it seemed to be worthy of inquiry whether those root crops which are easily cultivated might not be a valuable addition to the stores of winter forage. These hill and mountain towns are far removed from a market, and it is only in the form of dairy products, beef, mutton and wool, that the crops of the pasture and the field can be easily conveyed to a point of sale. It is to be regretted that the farms should not be compelled to feed in the winter all the stock they can support in summer.

GEORGE B. LORING.

HAMPDEN.

The undersigned, a delegate appointed by the State Board of Agriculture to attend the forty-third exhibition of the Hampden Agricultural Society, respectfully reports: That, owing to circumstances beyond his control, he did not arrive at Springfield until near the close of the first day of the exhibition, and

not until after the neat stock, swine and sheep, had been removed from the grounds, in accordance with the custom of the society, —a custom which, your delegate respectfully suggests, would be "more honored in the breach than in the observance." He would therefore recommend to the society the expediency of retaining the cattle and live stock during the forenoon, at least, of the second day,—thus obviating, in a measure, the common objection that horses are to be the chief attraction of the grand day of the exhibition.

The exhibition was held on the 3d and 4th days of October. The show of stock took place on the spacious and beautiful grounds of Hampden Park, owned by the society. The farm products, fruits, manufactures, and all other articles, were arranged in Hampden Hall.

The weather was fair during both days, and the attendance and interest satisfactory. The exhibition of stock, although not the largest, was considered one of the best ever made by the society, and in the opinion of a member of this Board, to whom your delegate is indebted for information, presented many points of excellence.

Among the entries of neat stock there were ten pairs of fat cattle, twenty-four yoke of working oxen, twenty-five milch cows, eleven bulls, and thirteen yoke of steers. Conspicuous among these were a yoke of fat oxen four years old, from Mr. George S. Taylor, of Westfield, weighing 4,500 pounds,—the Short-horns of Mr. Stedman, the Ayrshires of Mr. Birnie, and the Devons of Mr. Sessions. There were also some good Jerseys, and many fine grade animals on the grounds. All the fat cattle, except two yoke of oxen from Springfield, were from Westfield, a town long celebrated for its fine beef animals. The Short-horns and grades were considered as the best representatives of good beef growing, and the Ayrshires as embracing more good points for the dairy than any other. The Jerseys are, however, coming in as competitors in this line, and both of these breeds are on the increase in this county.

Of sheep there were twelve lots, embracing good South Downs, Cotswold and New Oxfordshire breeds.

Of swine there were fourteen pens, consisting largely of the Chester County breed, which, for rapid growth, are here, as elsewhere, gaining popularity with those who grow for market.

The ploughing-match took place on the afternoon of the first day. Eleven teams entered the field, two with the Michigan plough, and one with a plough made in the last century, and drawn with a pair of horses whose united ages were sixty-three.

Some trials of the speed of horses closed the operations of the first day.

Immediately after the arrival of your delegate at Springfield, he repaired to the exhibition of the society in Hampden Hall. The show here was interesting and creditable, although said not to be as extensive as usual.

The display of fruit, considering the very unpropitious character of the season, was better than anticipated, and here and there might be seen a dish of pears and apples of extra quality. Among the former was a dish of Winter Nelis pears, seldom if ever excelled in this State. The strong point of this department, however, was the collection of grapes. Splendid dishes of the Isabella, Concord, Hartford Prolific, Diana, Rebecca, Union Village, and Delaware grapes were shown, and of the latter it seemed to your delegate that no better could be produced than those contributed by the Rev. Dr. Ide and Mr. John B. Stebbins. And here it may be remarked, that although all of the above named grapes are considered hardy in this State, yet the revulsions which occasionally occur, like the extremes of the last winter, have taught us the lesson that in future the best policy will be to lay our vines upon the ground during the winter season. The only covering they need is a few inches of soil thrown over them, and in most instances when laid on the ground even without any covering, they will come out bright in the spring. There were also excellent collections of foreign grapes, from the graperies of Mr. Birnie, and also from Mr. Chapin, of the Massasoit House.

There were a few baskets of capital good apples, and among them a handsome one by Roger S. Moore, of Springfield, from a tree that produced this year twelve bushels, a striking evidence of the superior hardiness and capability of some varieties to withstand the greatest exigencies of our climate.

Cranberries here, as in other counties, are becoming an article of attention, and good specimens were exhibited.

Of vegetables the show was fair. Large collections were presented by Messrs. Atwater and other gentlemen. Among

them the potato appeared to have received especial attention in the production of several new varieties.

In plants and cut flowers the exhibition was very good, and in several of the collections were noticed the new varieties of the Gladioli, Dahlia, Zumia, Verbena, &c.

There were numerous contributions of agricultural implements, new inventions, domestic manufactures, fancy articles, bread, butter and cheese. As a whole the exhibition in the hall was one of interest and instruction to your delegate.

The exhibition of the second day at the Park opened with a grand display of horses. About one hundred and twenty-five were on the grounds, including twelve stallions, ten pairs of work horses, eleven breeding mares, twenty-five colts, of all ages, and twenty-two teams of carriage horses. There were further trials of the driving horses, and of heavy draught horses.

In all the classes there were animals of superior excellence, and better than can be produced elsewhere in the State; but the most attractive team was the Muzzy-Morrell family of horses, consisting of the Muzzy mare, twenty-eight years old, and her son, Young Morrell, stallion, harnessed into a wagon abreast with eight of his children. Mr. Briggs, the proprietor of Young Morrell, was the conductor of this wonderful team, and managed it with as much ease as he would have driven a common tandem team.

THE DINNER.

At two o'clock the president of the society, with his guests and about 150 members, sat down to a sumptuous dinner at the Massasoit House. The occasion was honored by the presence of His Excellency Governor Andrew, Rev. Dr. Hitchcock, of Amherst College, Dr. George B. Loring, of Salem, Mr. Luther H. Tucker, editor of the "Country Gentleman," Judge Vose, and other gentlemen of well known reputation.

Chester W. Chapin, Esq., president of the society, presided. After the eatables had been examined and disposed of, the intellectual feast commenced. Mr. Chapin introduced the exercises with an appropriate welcome speech, and was followed by Judge Vose, who in becoming terms alluded to the presence of His Excellency, the Governor of the Commonwealth.

Governor Andrew responded. He spoke eloquently of the importance and influence of the farmer's calling, and of the virtues and advantages which clustered around it. He considered agriculture as the great promoter of civilization, the bulwark of our government as well in time of war as in peace, and urged the necessity of following up the war to a successful issue in vindication of the integrity of the Union and the Constitution. He loved the Union because it was peace, and hated disunion because it would certainly lead to war. His speech was forcible and gave general satisfaction.

Your delegate was next speaker. He cordially concurred in the views of His Excellency the Governor, both in relation to the farmer and the Union. He urged a vigorous support of the government, and believed that He who rules in mercy as well as in justice, would eventually bring us out of all our present trials and make us a wiser and better people. He alluded to the first exhibition of the United States Agricultural Society, held in Springfield, and to its influence in giving character to that society. He spoke in praise of the exhibition, and of the liberality and enterprise of the citizens of Springfield, and expressed the hope that the efforts now making for the establishment of the Massachusetts School of Agriculture here would be successful. The subject of agricultural education had ever been one of the dearest objects of his heart, and he was rejoiced to meet here by his side a venerable and beloved citizen with whom he had in past times labored for the advancement of this cause, and whose Report to the State on the industrial schools of Europe was one of the most interesting and valuable State papers on record.

Dr. Hitchcock, ex-president of Amherst College, responded to the call of your delegate, and spoke at length of the project of the Agricultural School at Springfield, which he came there to endorse. He gave a very interesting account of his examination of the schools he visited in Europe. There were more than three hundred of all grades, and every one is in some way connected with a farm whose cultivation is required to be superior to that of the region in which it was located. Dr. Hitchcock felt confident that with an earnest and yet economical effort by those now moving in the matter, success would be sure.

Dr. George B. Loring, of Salem, was the next speaker. The Doctor commenced by cordially supporting the governor in his remarks as to the maintenance of the war and the vindication of the Union in its entirety, and the Constitution in its originality and equality of application. He urged the farmers of Massachusetts to the improvement of their opportunities. The markets at their doors they had neglected, and left the supply to come from the West. This State did not raise hay enough for its own wants. The farmers, he said, had not sacrificed their sheep to dogs, but to a shiftless husbandry. They should have three millions of sheep, not yielding a pound of wool and twenty-five pounds of mutton, but weighing from seventy-five to one hundred pounds per head. Such sheep we could have, and such would be found profitable. Such our farmers did have till they took the side of the dogs and raised fat curs and poor sheep. Dr. Loring also gave some very interesting accounts of his success in draining and renovation of exhausted and neglected lands, all of which was listened to with great interest. Mr. L. H. Tucker, of the Albany Cultivator, made the closing speech, in which he expressed his gratification with the exhibition, and what he had seen in former times of the farming in the western part of the State, and gave some account of his personal observations in his late tour in Europe. Thus ended the forty-third exhibition of one of the oldest and most respectable agricultural societies of the Commonwealth.

MARSHALL P. WILDER.

EAST HAMPDEN.

The ninth annual exhibition of the Hampden East Agricultural Society took place at Palmer on the 17th and 18th days of September and was attended by your delegate.

The first day was rainy, and probably many persons and some animals were detained from the exhibition on that account; for the number of persons and animals present was small.

The cattle were mostly Durham and Devon grades of fair size and in fine condition. A few were large. Two pairs, of three years old steers, were said to weigh three thousand

pounds per pair. About forty pairs of well-matched working oxen—four pairs of which, large, fat and handsome—from the State farm in Monson, also several fine looking bulls and a small herd of young cattle strongly marked with Durham blood, and half a dozen milch cows of no particular excellence, comprised the show of neat stock.

The ploughing-match which was announced in the programme, to take place at ten o'clock on the morning of the first day, did not take place at all, as no competitors appeared for the prizes.

As the drawing-match was not announced in the hearing of your delegate he failed to witness the performance, but was reliably informed that it was quite creditable to the competitors.

Only two lots of swine were shown, one by Colonel Cyrus Knox and son; the other by Joseph Weeks, Esq., of Palmer, all well formed, of large size and in good condition. No sheep were noticed by your delegate.

The vegetables were very fine, though by no means numerous, although one gentleman, A. R. Murdock, Jr., presented about a hundred specimens, consisting of several varieties of potatoes, turnips, tomatoes, squashes, beans, corn, &c. Colonel Knox had samples of corn, rye, wheat, beans, &c., of very excellent quality.

The articles of domestic manufacture were few, but of fine appearance. The specimens of butter, cheese, bread, cake, wine, honey, &c., as well as the fancy articles presented by the ladies, gave evidence of skill, industry and correct taste on the part of their owners.

No fruits of marked excellence were shown except a few bunches of Isabella grapes, which were very large and beautiful.

The mechanic arts were very feebly represented. Three or four agricultural implements, as root-cutters, corn-stalk cutters, &c., were shown.

The second day, which was more auspicious than the first, was devoted to the exhibition of horses, a dinner, a discussion at the table, &c.

The horses, though less numerous than the cattle, were much more powerful in drawing the people together, for the assemblage was much larger on the second than on the first day.

Among the horses were several noble animals. A few pairs of horses trained to the carriage performed well. The draught horses were large and powerful.

A few breeding mares with colts by their sides together with the colts of one, two and three years, although not of the highest rank, comprised by far the best part of the horse show.

The trial of the strength of draught horses was conducted as follows:—

Upon a wagon weighing six hundred pounds, were placed fifteen barrels of flour, and drawn by each of five horses some fourteen rods up an elevation of twelve to fifteen degrees (by estimation.) The load was drawn with different degrees of ease according to the weight, training, &c., of the different animals. Their average weight was about eleven hundred pounds.

At two o'clock, about forty gentlemen and a few ladies partook of an excellent dinner at the Antique House, after which the reports of the committees were read by the secretary of the society. Very few ladies honored the occasion with their presence.

As announced in the programme, the three following questions were proposed to be discussed at the table, instead of an address at the church:—

1. Are agricultural exhibitions beneficial to the community?
2. Is farming profitable?
3. Which is the most profitable, the raising of horses or cattle?

The first question was very briefly discussed by a few gentlemen, but a large majority of the company soon left the hall to witness the trials of the speed of horses upon the show ground. Thus ended the ninth annual exhibition of the Hampden East Agricultural Society.

Your delegate deems it his duty to say here, that the exhibition of the Hampden East Society did not quite come up to his expectations, nor to what in his judgment ought to be required of a society which receives the bounty of the State: he thinks there is a manifest want of interest among the members of the society, in the cause of agriculture generally, and that comparatively few devote sufficient time and attention to the interest of the society to render their exhibitions attractive or, in a

laudable degree useful. A few of the members manifest a deep interest in the cause, and to that few the society owes the degree of success that was attained at their late exhibition.

O. C. Felton.

FRANKLIN.

Thursday and Friday, September 26th and 27th, were the days appointed by law for the Franklin County show, but the National Fast occurring on the first day, the trustees very properly deferred the exhibition, which took place on Friday and Saturday, the 27th and 28th.

The show was gratifying and successful in every respect.

Notwithstanding the threatening appearance of the clouds on the first day, but little rain fell, and the attendance was good. The second was one of the finest days of the season, and the grounds were crowded with a highly respectable collection of persons, including many ladies.

The whole number of entries recorded was 705; in some instances single entries including 20 to 25 animals, 20 or more varieties of fruit, &c.

The number of animals exhibited was 861, exclusive of poultry.

The entries of neat stock numbered 350 head; the cattle were principally grade Short-horns, though there were several very fine thoroughbred cows and bulls.

On entering the enclosure, the first object of attraction was a collection of full-blood Short-horn cows and heifers, eight in number, whose average weight was nearly 1,500 pounds: they were excellent specimens of the breed, and gave evidence of generous keeping.

Moses A. Barnard, of Shelburne, exhibited three grade Short-horn cows, remarkable for size and symmetry, very high in flesh, at the same time bearing the points of superior milkers; one of the three had produced eighteen pounds of butter in seven days. Mr. Barnard received, as he unquestionably deserved, the first premium for dairy cows.

There were many other cows of fine appearance on the grounds, but it would require too much space to notice them

all: the character of nearly all the animals exhibited was superior, scarcely an inferior one being seen.

The most noticeable of the several attractive herds of cattle were those of O. O. Bardwell, John S. Anderson and Lewis Long, all of Shelburne; each of them exhibited from 20 to 30 head of cows, heifers and steers; many of them were extra animals, and all showed great size for their age.

John S. Anderson had on the grounds a three-years old grade Short-horn heifer, weighing 1,660 pounds; had never tasted grain. Also, a pair of twin heifers, two years of age in March last, and weighing about 2,600 pounds.

William Long exhibited steers remarkable for size and general thrift.

Of bulls, the number on exhibition was not large, but the quality was excellent.

It was gratifying to find that the famous Short-horn bull "Roan Duke," mentioned in the report of the Highland Society's show last year, had been again domesticated, and purchased by those excellent judges of stock, the Messrs. Anderson, of Shelburne. He was on the grounds, and attracted more attention than any other animal present, and will unquestionably prove a most valuable acquisition to the already fine stock of Shelburne; his progeny may some day be prized as highly as that of the bull "Northumberland," which was one of the first Short-horns brought into this section; many of the best animals exhibited claimed a descent from him. As showing how little the Short-horn blood was valued in this vicinity twenty years ago, it may be of interest to look into his history, which is here annexed:

The bull "Northumberland," (4,596) English Short-horn Herd Book, was bred by E. P. Prentice, Esq., of Albany, N. Y.; was calved Dec. 23, 1839; got by "Prince," of Northumberland, (4,826), dam "Appolonia," by Albion (2,965), &c.

Mr. Prentice presented or otherwise disposed of "Northumberland" to H. K. Brown, Esq., the noted sculptor. In February, 1844, Mr. Prentice and Mr. Brown called on Sanford Howard, Esq., then residing in Albany, requesting him to make selection of a bull from Mr. Prentice's herd for Mr. Brown to send his uncle, Mr. Samuel Child, of Deerfield, Mass. Of

several from which he was allowed to select, he preferred "Northumberland," having in view the locality and purposes for which he was destined. The bull was of medium size, generally good symmetry, mostly of a red color, with a few streaks of brindle about the head, neck and shoulders; knowing the Yankee prejudice against light colors in cattle, especially for oxen, (much stronger at that day than now,) and supposing that working oxen would be one of the objects in propagation, it was thought that "Northumberland's" color might serve to recommend him to favor. His dam was a great milker, but not of so good constitution as some cows. On the side of his sire he inherited a good fattening tendency, a property which he communicated in a striking degree to his progeny from grade and common cows. As a proof of the slight estimation in which the bull was held in Franklin County, it may be proper to mention that, in the fall of 1847, Mr. Howard called at Mr. Child's farm, and found the bull in course of preparation for slaughter. Mr. Child told him that the farmers paid very little attention to the bull, and would not avail themselves of his services at two dollars per head sufficiently to pay the expense of keeping him. The bull, however, was not killed at this time, but was sold and taken to Longmeadow, where he was kept two years. He was then purchased by a company of farmers in Whately, and kept for service two or three years; from Whately he was taken to Montague, kept two years, and fatted as a stag; he is said to have fattened like a steer. He was sold at Cambridge market, at the age of fourteen or fifteen years. His stock proved as good at the last as in his youth. After his progeny had demonstrated their superiority over any other stock in the vicinity, very much was said about the value of the "Northumberland" breed, which continues to maintain its high reputation to this day. Although he was not the first bull of the Short-horn breed in Franklin County, (there having been before his day bulls called "Durhams" brought from Hoosack, N. Y., that could be traced to importations from England,) he was probably of purer blood than his predecessors, and *his* great excellence was the foundation for the high repute in which the Short-horns are held through all this section of the State.

To return to the report of the exhibition: The pure bred Short-horn bull "Fourth of July," two years of age, was a

large and promising animal, of excellent disposition, and possessing many valuable points.

The town teams from Deerfield and Shelburne, together numbering fifty-three yoke of oxen, almost entirely grade Short-horns, could scarcely have been equalled in the Commonwealth for size, beauty and docility, nearly all of them were in very high order, speaking well for the pastures of this section.

The display of steers was unusually good, and the collection of oxen and steers alone, was attractive enough, to repay a lover of good stock, for a journey of one hundred miles.

The exhibition of sheep, taking into consideration their number and excellence, was probably in advance of any thing of the kind ever seen in the State.

The number of entries in this line was fifty-one, including over three hundred animals. It is gratifying to see the increased attention paid to this branch of farming; the hill portions of Franklin County are admirably adapted to sheep-husbandry, which was here once a leading business, the chief attention having been paid to the small, fine-wool varieties. For many years sheep have been gradually decreasing in numbers, their place being supplied by neat stock, chiefly Short-horn grades, with a view to raising oxen, which when grown, were usually sold to the feeders in the river towns, where they were stall fed for the butcher. The great West has injuriously affected the profit of this business, by delivering cattle at all our chief markets, fed on the rich pastures and cheap corn of that section, at a lower figure than can be afforded here, and probably in future the Valley farmers will find their best interest, in a great measure, to consist in feeding sheep rather than oxen.

There were exhibited fine specimens of the South Down, Cotswold, and Oxford Down breeds, the latter appeared to be the general favorites, and some of their lambs were remarkably promising.

Perley Ballou, with J. S. Grennell and S. A. Smead, were the principal exhibitors of Oxford Downs; G. W. Carpenter and Sons, and others, of Shelburne, made fine shows of South Downs. Of fine-wool sheep, the best exhibition was made by A. O. Buddington, of Leyden, and D. R. Bardwell, of Shelburne.

Swine. The favorite breed was evidently the Chester County; the number of entries was sixty. There were three or four fine boars, as many sows, and several litters of pigs exhibited of this variety. None of the Suffolk, Berkshire or other breeds were shown, but almost every animal was supposed to have a dash of Chester County blood; judging from the specimens exhibited this is justly a popular breed, the animals are long in the body, have no waste bone, are described as remarkably hardy, and as attaining a large size at an early age.

Of poultry, the entries were one hundred and twenty-five, principally of the most useful varieties. The turkeys were particularly fine and of large size; also, a few pairs of Rouen ducks, which were almost as large as geese.

Saturday was devoted to the display of horses; the number of entries was one hundred and fifty-one. The show was fair in number and quality; most of the animals seemed well adapted for service, (none of the *grey hound* varieties were on exhibition,) they were almost exclusively of the Morgan and Black Hawk families, of fair size, compactly built, and generally of good figure and action; judging from the horses on the grounds, those raised in this vicinity are fair travellers, and possess vigorous constitutions; from the break-neck pace at which they are driven down the mountains in the hill portions of the county, they must be unusually sure-footed or serious accidents would frequently occur. The colts were many of them very promising.

The in-door portion of the exhibition was held in the town hall; which was well filled with the varied products of the farm, household, and workshop.

The entries of butter and cheese were but twenty-two in number; the cheese was well spoken of, this part of the exhibition was altogether too meagre, and in so fine a dairy district as this, was without sufficient excuse, although it was said that the National Fast occurring on the day previous to the show, many samples from a distance could not be presented in season for the premiums.

A very fair collection of vegetables was noticed, generally excellent in quality; but comparatively few apples and pears were shown, the crop being exceedingly light here, as throughout

New England. Grapes were exhibited in great variety and profusion; there were tempting clusters of Delaware, Concord, Diana, and Hartford Prolific, with an unusually fine display of the Isabella. Doctor Beals, of Greenfield, made a splendid show of house grapes from his cold-grapery. The vines had been under cultivation but three years; the fruit was of extra size and quality.

A large and elegant collection of flowers graced the platform at the upper end of the hall, among which were many beautiful and tastefully arranged bouquets.

Of domestic manufactures, there was a large collection of useful articles; including home-made carpeting, flannels, stocking-yarn, and counterpanes; of the ornamental, there were exquisite embroideries in silk and worsted, and other needle-work in endless variety, also many specimens of painting and drawing with which the walls were adorned.

In the mechanical department, a collection of ploughs of excellent design and finish were exhibited by the manufacturers, Messrs. Smith & Field, of Greenfield; hay-cutters, root-slicers, and other labor saving machines, were also noticed.

The whole exhibition proved one of the best ever held by the society. It was a success too, pecuniarily, the receipts having been large, and the general expressions of satisfaction heard on all sides as the crowd dispersed at the close of the exhibition, was a guarantee that the society was accomplishing to a great extent, the objects for which it was instituted, in bringing the farmers of the district together in generous competition, encouraging improvement in stock, and progress in every thing relating to the farm.

It was a cause of regret that only the farmers of the immediate vicinity, (with very few exceptions,) were contributors to this show. Many of the more distant towns within the limits of the society were entirely unrepresented. If all societies would offer mileage on stock driven from a distance, it would serve to equalize the advantages of the exhibition, and it is to be hoped that those living at a distance would not wilfully throw away the benefits and rewards offered, on account of the trouble and inconvenience of attending. The lack of interest on the part of those remote from the place of exhibition, has become a serious evil in many parts of the State, and affords

one of the strongest arguments in favor of itinerant exhibitions, changing to the various quarters of the district, when none could complain that they were deprived of the benefits of the bounty so freely given by the State.

The grounds occupied this year for the first time by the Franklin County society, are centrally and conveniently located; a substantial fence has been erected about them, also a well-arranged building for covered pens, and a track one-quarter of a mile in length has been graded and fenced. More room is imperatively required; this was acknowledged by all, and a lot of land four acres in extent adjoining should, before another exhibition, be annexed. The only want, then, will be a building where the horticultural and mechanical display may be found without going off the grounds; this will come in due season, and, it is to be hoped, may include a hall for the address, with suitable rooms for the use of the officers of the society.

A short address of a practical character, with an opportunity for a pleasing interchange of sentiments, adds very much to general interest of these occasions. This feature was wanting here, its early restoration would be of great service to the association.

The whole supervision and management of this show, seemed by general consent to have been left in the hands of the capable and energetic secretary, (who is also the society's treasurer.) Had it been an enterprise for his own benefit, it could not have been more completely under his control. Only by the complete system adopted in the entry of animals and articles for exhibition, was he enabled to attend to more than his legitimate duties; his plan of printed headings for the use of the various committees, cannot be too highly commended; it should be generally introduced, as it saves much time at a season when every moment is valuable. The secretary seemed to be wherever he was needed at the proper moment; no one could have more patiently attended to the incessant calls that were made upon his time and attention; his constant good humor and ready invention overcame many difficulties. Every one was kept cheerful and all passed off pleasantly.

The fault here noticed is too prevalent in nearly all of our societies, that of leaving the whole burden of management on the

shoulders of one or two individuals; in all these associations each member should feel called upon to take his share of the duties; if the labor were divided between thirty, fifty or one hundred persons, very little would be required of each; every thing might be systematized, and the different parts of the exhibition rendered of much greater interest and profit; much ill feeling avoided, as well as the want of promptness and punctuality, which is frequently so great a drawback to many of our shows.

Noticing the superior quality of nearly every thing exhibited from Shelburne and Deerfield, and that a large proportion of the premiums were awarded to the enterprising farmers of those towns, your delegate was easily persuaded by the secretary of the society to pass a little time among them.

Shelburne is emphatically a hill town. Rising immediately beyond the plains of Greenfield it includes a collection of hills, composed of micacious slate, which upon decomposition makes a strong soil, well watered by springs starting from the bed rock, even to the hill tops, and rendering the town one of the best for grass to be found in the State; droughts do not injuriously effect the pastures, the springy nature of the soil keeping them fresh and green during the dryest seasons.

Comparatively little corn is raised, frosts coming early, and the soil being generally rather cold and heavy for that crop.

The first farm examined was that of the Messrs. Anderson, who rank at the head for superior stock, and for the intelligence and liberality characterizing all their management.

The farm is off the main road, and in most localities would be considered almost inaccessible; the buildings were all new, and the barn was of the best, combining a large amount of stable room, with great storage capacity, under a comparatively small roof; it was located on a steep side hill, and stood on the solid rock; the cellar was used for manure, the cattle standing on the floor above; the main floor for taking in the crops was immediately over the stables, and the drive-way was on a level with the ground on the upper side of the barn; the haymows commenced on a level with the cattle floor, and a large portion of the hay was thrown down rather than up; nearly one-half of the hay stored was rowen or second crop. It is almost the universal practice in this section to commence

haying by the middle of June, thus ensuring a second crop on nearly all of the mowing land. The Messrs. Anderson had their first crop housed this year June 25th, and cut nearly thirty-five tons of rowen; they esteem the early cutting of hay of great importance, and remarked that as they raised but little corn, they fat their cattle principally upon rowen, being enabled by feeding until about May 1st, to get as good prices for their beef as those who make a business of feeding with corn are able to obtain in March; they attribute much of their success in raising stock, to the fine quality of hay on which they are kept. They pay particular attention to their calves the first winter, giving them the best of their provender, and in every way encouraging a constant growth.

There can be no question but that the practice of cutting grass early, especially when it is designed for growing stock or cows in milk, might be generally followed to great advantage, but this cannot always be done; where Timothy is raised, a second crop cannot be expected, without the first is taken off before it is grown sufficiently to make it profitable to do so; but on almost every farm there is more or less land that may be kept in grass continually to a profit; by top-dressing, this land may all produce two crops of the finest quality of grass, if the first is cut very early, say in June. But little Timothy is raised in Shelburne the land being usually seeded with the finer varieties. Top-dressing mowing lands is almost the universal practice in this locality.

The pastures of the Messrs. Anderson are quite remarkable. Scarcely a bush or brier to be seen, and the grass, although late in the season, being in some of their pastures almost equal to a mowing field; they are cautious about over-feeding pastures, and deem it very desirable that a good covering of fog or old grass should be left on the fields through the winter. Their oxen, cows and steers are all Short-horn grades (descendants of "Northumberland" and are models of symmetry and thrift; their size was truly astonishing.

Farms occupied by Messrs. Lewis Long, George C. Dole, and G. P. Carpenter, were visited, all having barns on the principle described; their owners are working farmers, and were found taking advantage of this rather leisure season, in making

improvements; machines were in use for lifting and moving immense boulders, leaving the fields smooth and clear for cultivation, or for the mowing machine; tile drains were of frequent occurrence, and it was quite surprising to see a district so retired, the scene of so much intelligent improvement.

Captain G. W. Carpenter's farm was inspected; the buildings were located on the summit of an immense hill, commanding an unobstructed view of the surrounding country, in one direction to the extent of thirty or forty miles; it was a delightful location, and the farm was of the first quality. A noble herd of cattle was here found, also a fine flock of South Down sheep, which are receiving increased attention from their enterprising owner, as the demand for heavy oxen decreases.

No better township could be found for sheep husbandry than Shelburne, and considering the great and increasing demand for good mutton, the high prices of coarse-wools, the early maturity, and consequent quick returns to be derived from sheep, the increased value of their manure over that of cattle, being as one hundred to thirty-six, it cannot be doubted but that the farmers of this section will in a short time stock their excellent pastures with flocks of coarse and middle-wool sheep, to the gradual exclusion of the great Short-horns, which however noble and handsome they may be, are certainly an expensive luxury; they are rank feeders, requiring the best of pasture and provender to keep them in a thrifty state; and the day has probably gone when they can be raised to a profit hereabouts; a breed of cattle smaller and more easily kept would be found more valuable for dairy purposes.

A survey of the productive Valley of the Deerfield River, was obtained in perfection from the summit of Pocumtuck Mountain which rises abruptly from the meadows immediately back of the pretty village of Deerfield, which is a fine sample of a river town and contains many good farmers and much excellent land.

A marked improvement has taken place in the mode of farming in this locality within a few years; it has been proved to be more economical to manure higher, plough deeper, cultivate better, and work less land than formerly. Lands which twenty years ago produced twenty-five or thirty bushels of corn to the acre, now grow fifty to seventy-five bushels; where

one ton of hay was cut to the acre now three are frequently mown; one farmer has this year cut more than one hundred tons of hay from thirty acres of land.

Wheat is taking the place of rye as a more remunerative crop. Wheat and oats are sowed together in place of oats alone. Corn is thought to be the most profitable in the grain line, if a system of improved husbandry is used. Broomcorn was formerly a leading crop, but the West is able to raise and deliver it cheaper than it can be afforded here.

Tobacco is grown to some extent in most of the valley towns, but is not cultivated by one-tenth of the farmers; it is a very exhausting crop, requiring very high manuring and constant attention from the sowing of the seed until it is sent to market.

Not one-fourth as many oxen are fed in the river districts as was the custom fifteen years ago. The feeding of sheep is becoming the great business and has increased four-fold. The secretary of the agricultural society by a pretty careful examination estimated that in the winter of 1860–61 about 15,000 sheep were fattened in Franklin County. It has been the prevailing opinion that sheep could not be kept in good health in large numbers; it may be proper to state that one farmer in the town of Deerfield is feeding two hundred in an enclosure one hundred and fifty feet by twenty-four; mangers running through the centre of the pen, dividing them into two lots of one hundred each. Many farmers here think sheep the most profitable stock that can be kept, though some doubt the propriety of abandoning cattle entirely, thinking that both may be kept to advantage.

Your delegate desires to express his thanks to James S. Grennell, Esq., the worthy secretary and treasurer of the Franklin County Agricultural Society, who was indefatigable in doing every thing possible to render his stay pleasant and profitable.

HENRY H. PETERS.

BERKSHIRE.

Pursuant to appointment by the Board I attended the fifty-first exhibition of the Berkshire Agricultural Society at Pittsfield, commencing Wednesday, October 2d, (it being one day later in the week than required by law,) and continuing three days, closing on Friday afternoon.

This being the oldest agricultural society in Massachusetts, and I believe the oldest in the United States, with perhaps one or two exceptions, it might reasonably be expected that it would be more mature in all its parts than those societies which have been in operation but a few years. This much at least may be said of it, it has arrived to a high degree of excellence.

The show grounds, the half-mile track, the hall for the exhibition of the products of the farm, the garden and the dairy, domestic manufactures and fancy articles. The dining-hall and victualing stalls have all been described in previous reports, and nothing more need be said of them.

The first day was devoted, out of doors, to neat stock, sheep and swine. The neat stock was mostly grade Short-horn and Devon, and mostly fine, large, well-formed animals. If the number and quality of bull calves (of which there were seventeen entries) on exhibition is any criterion by which to judge, the farmers of Berkshire mean that their stock shall not only not deteriorate, but rapidly improve. And if calves fulfil what their looks indicate when so young, they will far excel their elders on exhibition ; in fact the young stock all showed good progress in the right direction.

The exhibition of milch and breeding cows (of which there were twenty-one of the former and twenty-nine of the latter) was very fine, probably as good a collection of grade cows as could be brought together, of an equal number, in the State.

The oxen were large, of good shape and well-matched ; but as there was no trial of working I could not judge of their abilities or training, but from appearances they could with proper training do any thing reasonable.

Of sheep there were sixty-seven entries, twenty-two of fine-wool, and forty-five of coarse-wool, indicating that this branch of husbandry received its due share of attention, and showing plainly that Berkshire people do not mean to be entirely under the control of king cotton.

Twelve entries of swine displayed some as fine porkers as one could wish to see.

The second day horses took the track, of which there were one hundred and thirty-seven entries, and among them many very fine ones. In this department, like those of neat stock, sheep and swine, the rising generation played a conspicuous part and gave promise that they would do no discredit to their progenitors, no discredit if they had proper attention. A mare with nine of her progeny by her side and following behind, all owned and exhibited by Colonel Pomeroy, was a sight not often seen nor easily beaten in Massachusetts.

The third day was occupied with ploughing-match, address, reporting and delivering premiums, and horse-trotting. The ploughing-match came off the first thing in the morning, and was one of the most attractive features of the occasion, except horse-trotting, which always draws the crowd. Thirteen horse teams and seven ox teams competed and performed their work to the satisfaction of a large and interested crowd of men and women.

The hall, which is large and commodious, was occupied the first and second days for the exhibition by all kinds of farm and garden products, domestic manufactures and fancy articles, and was extraordinarily well filled, especially that part depending upon the ladies, there being some thing like three thousand pounds of cheese, five hundred pounds of butter, with bread and honey to match.

On the third day after the ploughing-match, the hall having been cleared, was soon filled with a large and attentive audience to listen to the annual address and the awarding of premiums, they being all given in plate and arranged on a table in front of the speaker's stand in full view of the audience; thus serving to keep up the interest to the last.

In closing allow me to say that in the opinion of your delegate Berkshire County society is one where the mass of the people, both old and young, rich and poor, evidently manifest a decided interest in the advancement of agriculture and the success of the society, and where the State's bounty answers the end for which it was appropriated as well as in any society in the State.

SHERMAN CONVERSE.

HOUSATONIC.

The exhibition of the Housatonic Society was held on the 25th, 26th and 27th, of September, at the beautiful fair grounds in Great Barrington—so beautiful and picturesque, that the first attention of the visitor is confined to the display which nature herself has provided, in this romantic section of our State. The selection of grounds in such scenery is indeed worthy of notice, and whoever would witness and admire the luxuriance of a landscape in Massachusetts, should visit this spot. To the Housatonic and Berkshire and Hampden societies, we are indebted for exhibitions of natural scenery in the location of their fair grounds such as is rarely seen in any quarter of the globe.

After due attention to the attractions of nature, your delegate was called upon to examine the exhibition of animals, crops, and manufactures. The hall of the society was crowded with a remarkable display of articles of taste and usefulness, mostly the handiwork of the families of the farmers of the region. The exhibition of grain and root crops, and of fruit was excellent.

The entries of cattle were numerous. The quality of the dairy stock was especially worthy of notice. The oxen were remarkable for symmetry of form, and for uniformity of size best adapted to labor on New England farms.

The sheep exhibited, indicated care and attention to this animal, worthy of imitation throughout the State. Fine-wool predominated.

The swine were well selected and evidently well cared for; the best specimens being of the breed commonly known as "Byfield."

The ploughing-match was well conducted, but both with the ox and horse teams, there was a deficiency in the depth of ploughing. Of ox teams there were seven entries, and of horse teams twelve, it being evident that on the easy lands of this valley the latter receive the preference.

The horses on the ground were numerous and attractive; and it is doubtful whether any society in our State could show a better collection of stallions, mares and colts, horses of all work, and matched pairs. The trials of speed were good.

The exhibition of this society occupies three days, and is evidently a jubilee for the neighborhood. Its affairs are well managed, and its annual receipts from various sources are sufficient to defray all its expenses, including very liberal premiums, and to liquidate a portion of the debt incurred for grounds, buildings, &c. The income for the present year, including the State bounty, was about three thousand dollars.

The portion of the State occupied by the society, is rich in agricultural resources. As a grain-growing district, and in the production of wool and dairy commodities it is hardly excelled. The shows are therefore extremely interesting and profitable to the observer of farming. And it is evident that the members of the society are determined that it shall be second to none in the State, in the work of stimulating and encouraging progress in the art of agriculture.

George B. Loring.

HOOSAC VALLEY SOCIETY.

The programme for the second annual cattle show and fair of this society was evidently made out with a design to accomplish the purpose for which such exhibitions receive endowment from the Commonwealth. The general causes of success or failure in the management of agricultural fairs were kept in mind from the beginning of the exhibition, September 17th, to the close, on the evening of the 18th. No unnecessary outlay appears to have been made by the society in the way of preparation for its exhibitions, and no necessary outlay appears to have been omitted which would materially advance the immediate interests of the society. There is abundant wealth belonging to members of the society, and I doubt not that as soon as more permanent improvements appear to be a necessity, the means necessary will be provided.

The first day was mainly devoted to cattle and minor stock of the farm. During the forenoon, the citizens of Adams formed in procession, and led by a band of music, escorted to

the fair grounds, a decorated car, drawn by *forty yoke of oxen*, belonging to the farmers of the town of Florida; the car was filled by the farmers' daughters, countless in number, as they were packed as closely as the leaves of a budding rose.

The morning of the second day was mainly devoted to the hearing of an address by J. N. Dunham, Esq., prepared for the occasion and delivered from an open stand near the centre of the fair grounds, and the enjoyment of a sociable dinner and lively speeches, both of which were of the digestible kind. Immediately following was the exhibition of horses. Over five thousand persons were assembled to enjoy the closing scenes of the exhibition, and they were heartily enjoyed by all.

List of Premiums.

	Number offered.	Amount.	Entries.
Summer crops,	25	$53 00	22
Fall crops,	39	74 00	22
Experiment in Manures,	3	50 00	1
Fruits,	6	12 00	2
Vegetables and Grass Seeds,	9	15 00	35
Cheese and Butter,	6	18 00	19
Maple Sugar, Bread and Honey,	9	11 00	28
Floral department,	6	10 00	5
Household manufactures,	18	20 00	74
Neat Stock,	47	110 00	61
Horses,	44	135 00	88
Sheep, Swine and Poultry,	34	60 00	47
Mechanical productions,	6	25 00	26
Other entries,	–	–	9
Total,	252	$593 00	439

The total number of premiums awarded was $466.

The entries were eighty-eight in number over the entries of last year, thirty-five of this number being in entries of horses.

The number of persons who received premiums was one hundred and eighty-six.

The number of entries of horses, four years of age, and of colts three years and under, was larger than we are accustomed to see in county exhibitions. The number of dairy cows was unusually small. In this society's precincts the number of

horses is much greater than the number of oxen and steers; and the number of cows and heifers is more than *double* the number of horses, oxen and steers. The limited number of dairy stock shown at the exhibition will unquestionably fix the attention of the officers and members upon the subject and thus guaranty a full performance of duty *in this particular* in coming exhibitions. The breeding of horses, begun in earnest, should be continued under the most favorable auspices which unity of action can support.

The premiums of this society are chiefly distributed in the towns of Adams, Cheshire, Clarksburg, Florida, Hinsdale, Lanesboro', Savoy, Williamstown and Windsor.

The amount of capital employed in manufacturing in these towns is two million three hundred and eighty-seven thousand dollars; number of hands employed, 2,578. The population of these towns was in 1840, 11,260; in 1850 it was 15,275, an increase of over thirty-five per cent, in ten years. One person in every six of the total population is engaged in in-door labor, as consumer and not producer of agricultural products.

The number of sheep kept in 1855, in the towns named, was 24,069; horses, 1,996; oxen and steers, 1,693; cows and heifers, 7,480; pounds of butter made, 337,510; pounds of cheese, 1,111,490.

27,441	acres of Mowing Land, yield 22,674 tons.	
108	acres of Wheat, average yield to the acre 22 bushels.	
337	acres of Rye, " " " 15 bushels.	
346	acres of Barley, " " " 26 bushels.	
2,551	acres of Oats, " " " 31 bushels.	
2,094	acres of Indian Corn, " " 32 bushels.	
115	acres of Buckwheat, " " " 20 bushels.	
11¼	acres of Carrots.	
402	acres of Beets, Onions, Tobacco, and other crops.	
Timber annually sold from the farms, value, ...		$50,500 00
Wood " " " "		$82,225 00
Apple Trees reported under cultivation, number, . . .		40,069
Pear " " " " " . . .		917

The bottom lands of the Hoosac Valley, will compare favorably with the best lands in the State. The prices at which they are held, $50 to $70 per acre, makes it comparatively easy for the

farmer to profit by them. The upland mowing lands are valued at from $40 to $50 per acre, and are owned to advantage. The mountain and hill-side pasture lands are valued from $5 to $20 per acre; three to six acres being usually allowed to furnish summer feed for each head of stock. The woodlands (which make up a full portion of each farm) are valued at $15 to $20 per acre, and are also found profitable in the making up of the farmer's account. The soils of this district, beginning with a clayey loam, rising to the tillable uplands, become a gravelly loam, generally free from stones. The hilly and mountainous lands have a better soil than we are accustomed to find on the eastern portions of the State in land similarly situated.

The average price of hay for ten years is about $11 per ton. The average price of potatoes for a like period from 28 to 30 cents per bushel.

No person can visit the Hoosac Valley without a feeling of surprise that the measures undertaken to bring the people of this portion of the State into closer relations with the centres of trade, should have been so long delayed. As already shown, the increase of population within the district named, has been in ten years, thirty-five per cent. With similar facilities to those enjoyed in other sections of the State, the population would doubtless double in numbers within a period of ten years following the completion of such aids to thrift.

The farmers of Hoosac Valley seemed to be settled for life. The homestead and farm buildings; the orderly manner in which the farms are conducted; the dairy management, and the quality of the product of their dairies; the orchards; the ample gardens; the abundance of vegetables; the attention given to the cultivation of flowers, and other interests which bring contentment; these together witness to the fact that the Hoosac Valley is their permanent home. Here also are the model mountains, the hill-sides, the rich meadows and the numberless rivers which are the pride of the Commonwealth, and which give dignity and attraction to a pastoral life.

GEORGE M. ATWATER.

NORFOLK.

The twelfth annual exhibition of the Norfolk County Society was held on the 24th and 25th days of September, and was every way successful. The weather was remarkably fine, and all classes of the community were out in large numbers to see, be seen, to have a genuine holiday, and to help and encourage each other in the laudable pursuit of husbandry. The out-door exercises, which were continued through both days of the exhibition, were the usual show of the various kinds of stock, the spading-match, ploughing-match, trial of working horses and oxen, and trials of speed of horses at the walk and trot. In the hall of the society were exhibited, in rich profusion, specimens of the handiwork, skill and taste of the women of the county, in bread, butter and cheese-making, and the various branches of domestic and fancy manufactures; also, specimens of the products of the fields, gardens, orchards, and workshops. The occasion was made interesting by a public dinner in the capacious upper hall, which was crowded to repletion, by a most instructive address from Professor Agassiz on the helps of science to agriculture, and by speeches from President Felton and others. All parts of the exhibition attracted much attention; as a whole it was admirable, and the various exercises were entered into with a zest and enthusiasm creditable to all concerned.

Former delegates to this society have spoken particularly of the different branches of its exhibition, have described its exciting spading-match in the natural amphitheatre on the grounds, have made mention of its peculiar Jamestown and Kerry stock, and of its fine Jerseys and Ayrshires. I was personally much interested in all these departments, but for me to describe them in detail would be simply a repetition. I will therefore, without consulting any authorities or statistics, state my impressions of the Norfolk Society, and of Norfolk County, as derived from this exhibition. Its energetic and sagacious president is a veteran in the cause of improved agriculture, and has had large experience in all departments of agricultural exhibitions. He has brought this show to a perfect system, and made spectators feel that they are to have their full money's

worth, and exhibitors and officers to deport themselves accordingly. The principle that "he that soweth bountifully shall reap also bountifully" is fully illustrated. As a consequence no interest is forgotten from the raising of poultry to the minute management of the most extensive farm. Liberal premiums are offered for successful effort in all the multitudinous branches of agriculture. Rare and valuable specimens of stock, of products and handicraft are sought out, and their presence at the show secured. The varying tastes, loves and admirations of individuals are remembered, and the object of their love and admiration placed on exhibition that the questioning curiosity of spectators and learners shall be fully satisfied. The thousands who came thronging into Dedham on the morning of the second day, were apparently imbued with the idea, that there was to be something there worth seeing and learning, and they were bound to make the most of the opportunity. And although the soap peddler and Sambo with his fiddle were both on the ground, yet order, decorum and attention to the legitimate duties of the occasion pervaded the multitude, and I doubt not many a farmer and artisan went from the show to his home a wiser if not a better man. From as careful an examination of the entries as time would permit, I fear that notwithstanding the excellent management of its officers, the usefulness of this society is somewhat curtailed by the common fault of localization; and that Dedham and the adjoining towns within a few miles of the place of exhibition, furnish much too large a proportionate share of the exhibitors; yet it is in a high state of prosperity, and in a legal and legitimate way is accomplishing the great objects of its incorporation. From what I saw (or from what I did not see) I infer that sheep husbandry is sadly neglected in Norfolk County, and that the production of milk attracts more attention than the making of butter and cheese. Also that the raising of stock (cattle and horses) is not one of the chief pursuits of its farmers, and though they admire and possess the excellent of both kinds, they prefer to a great extent to purchase them from abroad. Oxen, I conclude are worked but little, and the sturdy draught horse performs most of the labor on the farm and road. All the numerous branches of yankee manufacture are extensively pursued, and great effort expended in floriculture, horticulture

and market gardening, as more profitable in their circumstances than the raising of hay, grain, and beef for market.

In closing this report, I feel in duty bound to make mention of the cordial reception and numberless attentions I received from the officers and members of the society as the delegate from your Board, evincing as it did the high appreciation of the members of the Norfolk Society of the Board of Agriculture. I shall ever remember with the greatest pleasure, the courteous attentions and cordial hospitalities of its president, the Honorable Marshall P. Wilder, and the frank, hearty "glad to see you" of its farmer members.

LEVI STOCKBRIDGE.

BRISTOL.

The Bristol County Agricultural Society held its annual fair and cattle show at Taunton on the appointed day, first of October; and, in pursuance of my appointment as delegate, I attended on that day, as well as the succeeding one, and have much pleasure in stating that the occasion was interesting and satisfactory. The weather was propitious, and a large number of persons was attracted to the enclosed grounds of the society, consisting of fifty-five acres, in the suburbs of the town.

The exhibition of the products of the farm and manufactures was held in an extensive temporary building, which at no distant day will be replaced by a substantial edifice intended to be an ornament to the town. There were six hundred and seventy-five entries of farms and their products, and six hundred and forty-five of heavy and domestic manufactures. The most interesting feature of the first day was a team of fifty-nine yoke of oxen from the town of Norton drawing a large vehicle containing the young ladies of the Wheaton seminary of that place. From the little town of Raynham a team of thirty yoke of working cattle made a fine appearance.

The display of fat cattle, cows, and calves, and bulls of native grade and full-blooded animals, was numerous, and good, and creditable to the breeders of Bristol County: although not a strictly grazing district, these pursuits are much

stimulated by a profitable market afforded by the large manufacturing towns. There were fifty entries of horses and colts, and their appearance evidently manifested that some attention had been shown in the breed of the equine race.

Of sheep and swine there were forty-nine entries; of the former only a few specimens, and not worthy of remark; of the latter, there was a large number of the cross of the Suffolk and Mackay, which, although not large, appeared as if they could be easily and cheaply fattened.

The feathered tribe was numerously represented, in size and variety. Of butter and cheese there were eighteen entries; the former was neatly exhibited in stone jars. Specimens of needle and fancy work were numerous and neat. The ploughing-match took place on the first day; thirteen yoke of single teams and six of three-cattle teams—steers and horses—competing for the premiums. The work was creditably performed, mostly without drivers and with the double Michigan plough, which I thought rather too heavy for the teams, but when they warmed up they drew their burden with more ease. The exhibition of fruit was not remarkable, the apples being very inferior in appearance; a variety of specimens of the pear appeared better; the grapes, however, both native and foreign, looked well, and a single dish of peaches, from the garden of Dr. Durfee, seemed to have attained their full growth.

On the second day more than four hundred persons seated themselves at a substantial repast, at which Mr. Daggett, the president of the society, made a congratulatory address, and some of the ministers of the town and vicinity made short and pithy remarks, after which a synopsis of the reports of the committees was read, when the company adjourned to witness a horse race which claimed their undivided attention.

Taking into consideration the number of people present within the enclosure, estimated at from three to four thousand, it is worthy of remark, and I make it with pleasure, that I did not witness a single instance of disorder or intemperance. My thanks are due to the Hon. John Daggett, the president, the board of managers, and other gentlemen, for their kind greetings and attentions.

CHARLES B. ALLEN.

PLYMOUTH.

As a delegate from this Board, I attended the annual exhibition of the Plymouth Agricultural Society on Thursday and Friday, October 3d and 4th. This society, upwards of forty years old, has reached an elevated position among the societies of the Commonwealth. The last exhibition, in its results and details, goes to prove that there has been no degeneration, but that the whole matter of agricultural festivals has been reduced to a perfect system. The weather during both days was the very perfection of our "Indian summer," and the large number of visitors throughout seemed to enjoy the occasion as if wars and rumors of wars had become obsolete.

The eligible and extensive grounds upon which the whole of the exhibition is spread out contribute very much to its success. The ploughing during the morning of the first day was a fine exhibition of skill in that regard, the various entries being ten in number. The quality and texture of the soil, however, was such as would hardly bring out all the skill of a master ploughman. The exhibition of stock gave abundant evidence that a leaven had been for a considerable season in operation. The four more prominent breeds of neat stock were represented by pure bred animals, most of them of superior merit. The entries of neat stock numbered 579; of swine, 60; sheep, 75, and horses, 60, making up, as I was assured, the best show of stock that had ever come together under the auspices of the society.

Within the exhibition hall there was a very fine display of specimens of all the varied products of the field, the garden, the orchard and workshop. The dairy and the studio were also well represented, and the fancy department had by no means been neglected. The show of fruits, as elsewhere throughout New England, was necessarily very limited in amount, but was the finest I had seen. Grapes, which are occupying so much attention at the present time, were displayed upon the tables in abundance, some of them being very fine and others entirely unworthy of cultivation. Vegetables, as everywhere else this year, were unusually good and abundant. In the mechanical department, the claims of different straw and stalk-cutters,

harrows, clothes-wringers, &c., were urged upon the attention, each assuming to be more valuable than its competitor, but all premising to be labor savers.

The second day was specially devoted to the examination of horses, though all the stock in pens were still retained upon the grounds, so that a person could not visit them during any part of the two days and find the "cattle show" absent, as is too often the case. The latter is generally hurried out of the way to make room for the horses. Here the horse was assigned exactly his proper position, and engrossed just the attention to which he is entitled and nothing more. As the premiums upon stock were announced from the judges' stand, the animals to which they were awarded were led up and designated, so that every visitor could have an opportunity to assist his own judgment by comparison with the decisions of committees. At one o'clock a large company sat down to the society's dinner, after which His Excellency Gov. Andrew, with other gentlemen, addressed the assembly. At my departure, I could but feel that the Plymouth Society was accomplishing its mission in elevating the dignity of agriculture, and increasing the number and intelligence of its devotees.

JABEZ FISHER.

BARNSTABLE.

Having been appointed by the State Board of Agriculture a delegate to attend the annual exhibition of the Barnstable Agricultural Society, holden at Barnstable, on the eighth day of October last, I attended to that duty, and make the following report:—

The weather on the first day, (October 8th,) was very rainy, accompanied by a high wind, (disarranging the general programme of the exhibition, as I was informed.) I visited the grounds and hall of the society on the morning of the 9th,—the storm having subsided, and, excepting the high wind, a pleasant day.

I commenced an examination of the stock in the pens, where I found a very fair show of fat cattle, comprising quite a number of pairs of oxen of medium size, some of which were quite fat.

Also, quite a number of pairs of ordinary working oxen, not showing the careful matching and training that we see in Worcester and some other counties; and a few pairs of good steers, which bid fair to make good oxen if properly trained. There was quite a large number of milch cows, which, with a few exceptions, were apparently of ordinary or poor quality; which was not at all surprising to me when I saw the bulls the farmers of Barnstable breed from,—if those on exhibition were the best animals,—of which there was quite a large number, all of which were of natives or grades, and of poor or ordinary quality at that.

Of sheep the show was quite good in quality and numbers, among them some very good South Downs, and two good bucks; to which some of the land in Barnstable County seems to be better adapted than to cattle.

Of swine there was a very good exhibition; among them some superior boars, sows and pigs, principally of the Suffolk breed or Suffolk grades, and indicating that the farmers of Barnstable know how to breed good pigs.

The exhibition of horses was composed of a few stallions, a large number of mares, and colts of all ages, and a number of draught and driving horses; there were a few colts among the number which were promising animals.

The ploughing-match began about nine o'clock, A. M., on land adjoining the exhibition lot. Some of the land was not very favorable for handsome ploughing, owing to knolls and depressions of the surface—by which the furrows on a part of some of the lots had to be turned up hill, which is a more difficult operation to perform than to plough on level ground. There were eight or nine teams—part horses and part oxen—contending for the premiums. The teams did not show good training; and the straight, even and well-turned furrows which mark the Essex, Middlesex and other ploughing-matches, were wanting. Good ploughing is the foundation of good cultivation, and here there is certainly a chance for improvement, both in the ploughing

and the ploughs used,—some of which were evidently unfit to do good work. There are two things that it is necessary for every ploughman to know how to do to make good work,—one is to keep a straight furrow, and the other to take the same width of furrow slice every time, thus making each furrow exactly fill the space left by the turning of the previous one.

In the hall there was quite an imposing display of various articles; of which there was some half dozen lots of butter, and as many more of cheese, of fair quality; and a large display of vegetables. The field beets, turnips, pumpkins, squashes and cabbages were very good, some of the other varieties of vegetables were raised from impure seed, which every good cultivator should avoid sowing.

Fruits were not shown in large quantities, owing, no doubt, to the unfavorable season; but still there were some dishes of very good pears and quinces; the apples were poor, as they generally have been at nearly all of the exhibitions in this State this autumn. There were some baskets containing very handsome, high-colored samples of cultivated cranberries, which Barnstable County seems to be particularly well adapted to, and of which the culture appears to be extending fast.

Also, a good show of wild flowers, and a large quantity of cultivated ones; and bread of different kinds, and in large quantities; also, pickles, jellies, preserves, &c.

And a very fine and large exhibition of household manufactures and needle-work, much of which was quite handsome and creditable to the society, and the ladies who exhibited the same.

And, in conclusion, I would venture to suggest to the officers of the society that they post up in conspicuous places printed programmes of the time and places of holding the ploughing-match, trial of horses, oxen, and hearing the address, which would render it much more convenient for visitors to the exhibition.

JOHN B. MOORE.

NANTUCKET.

The annual exhibition of this society was held on the tenth and eleventh days of October, and attended by me as delegate of this Board.

The area over which the limits of this society extend is so small and of such peculiar character, that the annual exhibitions must be marked by fewer variations than are usually observed elsewhere. Therefore, after the full and able reports of the gentlemen who have preceded me here as delegates of the Board, there remains but little to be offered, either in the way of description or of suggestion.. In justice, however, to the society,—struggling with difficulties which cannot be measured by any who have not had the like to encounter and overcome,—and in justice to my own feelings, I cannot omit to say that the exhibition, as a whole, was attractive and creditable. Preparations for it, demanding an expense of much time and labor, had been completed. The arrangements on the show-grounds and in the hall were well designed, and in all respects suitable. Good order and general quiet prevailed, and a lively interest in the purpose and object of the occasion was manifest throughout the mass of the people. The weather, during most of the time, was extremely uncomfortable ;—materially affecting, of course, the attendance which had been anticipated, and, indeed, the whole character of the out-door exhibition. The ravages of the army-worm, and the general blight of fruit trees,—felt more keenly here, perhaps, because of the limited cultivation on the island,—tended to detract from the extent and beauty of the show.

We observed upon the grounds a goodly collection of neat cattle,—particularly of young stock;—horses, swine, sheep, and poultry; and the examination of these several departments was conducted in a way that might well be imitated by other societies; only the committees and your delegate being allowed to remain within a prescribed distance around the premises, during the examination. There were, also, trials of speed, in trotting; of skill, in ploughing; and of strength, in drawing; all of which were well performed, but exhibited no decided marks of superiority.

The fact has been stated before, and it should be repeated, that animals of great superiority, owned, in some instances, by members of the society, are not offered here, either for exhibition and to give character to the show, or for competition. Your delegate observed in different parts of the island,—which, through the kindness of Hon. E. W. Gardiner, he had opportunity to see,—a large number of animals, particularly of milch cows and sheep grazing in the fields, and of swine lying in their pens, which, had they been present, would have added much to the character of the show. We are not aware of any good reason for withholding this sort of aid from the society; and allude to the fact as one that ought, unless such reason exists, to be done away. Certainly every good farmer, if a member of an agricultural society, is under an implied obligation to uphold the character of that society by every means in his power; and to further the interests of agriculture by any display he can make of superior animals, or of extraordinary productions of his farm, by way of example to others, if not of benefit to himself. Especially is this incumbent upon him, where, as in this case, the locality and circumstances of the society must necessarily circumscribe its operations within narrow limits, and admit of no large display of agricultural thrift or improvement. It is hard, under any circumstances, for a few individuals to uphold and carry forward an enterprise in which the whole community is equally interested. Not least so is it in regard to the support of an agricultural society, and the encouragement of agricultural improvement. In Nantucket, if anywhere, there should be an unanimity of feeling and action in the society which would give vigor to its operations, and a higher character to its out-door exhibition.

We take pleasure in saying that, in the hall, where fruits, flowers, vegetables, grains, and specimens of almost every sort of domestic manufacture and mechanic art, were exhibited, the show was one of uncommon excellence. Persons were present, whose opportunities of observation and comparison are of wide extent, and whose judgment can be relied upon, who freely declared that the exhibition of fruits, flowers and vegetables, could not have been surpassed, in quality, in any part of the Commonwealth. Certainly the soil and climate of Nantucket,

under the industry and intelligence of her cultivators, are suited to the growth of vegetables and of fruits, at least equal to those of any territory of like extent which we have ever seen, except in immediate proximity to the capital of the Commonwealth.

In the department of the dairy, also, the products excelled in quality, much that we have elsewhere observed at similar exhibitions.

Among the few agricultural implements on exhibition we observed a seed-sower, embracing some new principle in the mode of distributing seed, which was the invention and construction of a young man who has been, for many years, an invalid and cripple, and was able to stand only on crutches, while making this neat and useful machine. We understood that this seed-sower had been successfully used; and deem the fact of its construction, under such circumstances, worthy of special notice. We think it due to the young man himself, and that it may encourage other unfortunate sufferers who, like him, strive to keep alive the hope and purpose of usefulness, when no longer able to engage in the ordinary occupations, or even to share the common satisfactions of life.

Specimens of art, ingenuity, skill and industry, in things useful and ornamental, were tastefully arranged around the room, and commanded much attention and admiration. Decorations adorned the hall, which were appropriate and significant in these times of civil commotion, and expressive at once of the patriotism and the tender sensibilities of the people.

The principal feature of the occasion,—that most relied upon, at least,—was the exhibition in the hall. The hall was lighted during both evenings; and the attractions of social intercourse and of excellent music drew together the largest assemblies of the people that could conveniently meet there. No formal address was had, but occasional, brief speeches were interspersed with music and conversation. In this way, the Nantucket Society enjoys a pleasant annual meeting; its funds are enlarged, and the great interest which it aims to foster is sustained.

We have spoken of the soil and climate of Nantucket as particularly favorable to the growth of vegetables and fruits.

There are parts of the island which present fine intervals for cultivation. Lands reclaimed from salt marsh or from fresh bogs, have been made productive of good crops of grass and grain; or, are devoted to the growth of cranberries or other small fruits. An enterprise of great importance and value was commenced here a few years ago, by which a large tract of almost barren land has been covered with a comparatively dense and vigorous growth of pitch-pine trees. Our conviction is strengthened by all observation and reflection, that, with similar application of capital and good judgment, a great part of the island,—once the common range of large flocks of sheep, and still open and undivided, and nearly useless,—might be covered with different sorts of trees, affording an abundant supply of fuel and timber, and protecting the dwellings and gardens of the citizens from the bleak winds that sweep over them from the ocean.

The fact that, in dredging the harbor of Nantucket, a few years ago, a submarine forest was discovered, portions of which were buried four feet below the sand, authorizes the belief that the island was formerly covered with wood; and suggests the inquiry whether its soil may not still be capable of sustaining a similar growth of oak, maple and cedar trees. The bottoms of ponds and valleys, also, afford evidence of a former burden of heavy wood. Now if sheep-husbandry is absolutely abandoned here, we know of no better way to restore the value of this barren soil than by the planting and growth of trees.

Nantucket has probably suffered more extensively from commercial derangements and devastating fires, and from depopulation and general depression of enterprise, than any other part of the Commonwealth. Once the seat of heavy capital and of extensive operations in commerce and navigation, her streets thronged with a busy population, her wharves occupied by many large ships, or crowded with cargoes unladen from those ships, and bearing in every direction marks of industry, enterprise and wealth, she is now comparatively stripped of all that then contributed to her prosperity and fame, except the riches of her citizens in sterling principles, in social elevation and refinement, and in a regard for the great interests of education and virtue.

We hope the day is not distant when her absent sons may return; her commercial prosperity be revived; her harbor be filled with sails; her soil be covered with thriving farms, gardens and woodlands; and her people be rejoiced again in the possession of all that once gave them wealth and strength, enterprise and fame, and made the happiness of their island-home.

In the time of her prosperity, Nantucket gave light and comfort to many thousand homes upon the main. In the time of her adversity, may her citizens, like the Israelites of old, when darkness was over all the land of Egypt, have light in their dwellings, and peace and hope in their hearts!

CHARLES C. SEWALL.

MARTHA'S VINEYARD.

The Martha's Vineyard Society held its third annual fair and cattle show on the day appointed by the law—fifteenth of October. I was present most of the time on that day as well as the succeeding one. The display of neat cattle, consisting of fat animals, working oxen, milch cows, and bulls, was much larger, amounting to nearly a hundred head, than at any former exhibition; the same remark will apply to sheep, the production of which is commanding increased attention. The introduction of a grade of the Cotswold and Leicester from Vermont has increased the island stock both in size and quantity of wool. The farmers depend much on the sale of wool and store sheep to pay their cash expenses. The latter is in constant demand from the continent where they are much prized, and from three to five hundred are annually disposed of. Flocks from abroad highly fed do not prosper on the lean pastures of the Vineyard. There is a wide difference among our farmers whether sheep conduce to the preservation of pasture lands, many holding that by their close feeding the sweet and finer grasses are destroyed, but all agree that for tillage they afford a valuable preparation. There was a great variety of samples of Indian corn, and of fine quality. Wheat growing

is increasing since the erection of a flour-mill on the island; a few samples were exhibited, but not of so good a quality as usual. There were a few swine of good size, and the usual variety of poultry. A few samples of butter and cheese were on exhibition; the former, on account of the atmosphere of the room, did not present a very tempting appearance.

Since the spirit of competition produced by the establishment of the society, much more attention has been paid to horticulture, and a few but very handsome specimens of apples, pears, and grapes were exhibited.

The display of vegetables was very good, especially of squashes, to the raising of which more attention is being paid in producing kinds of a larger size.

In the female department there was a good display of knitting and needle work.

In conclusion I am happy to state, there was no want of interest exhibited in farm husbandry. I think nearly one-half of the population of the county must have been present on both days, and the contributions to the society were larger than last year.

CHARLES B. ALLEN.

APPENDIX.

FINANCES.

SOCIETIES.	Amount received from the Commonwealth.	Income of the permanent fund.	New members and donations.	All other sources.	Receipts for the year.	Premiums offered.	Premiums and gratuities paid.	Current expenses—not including premiums and gratuities—for the year.	Disbursements for the year.	Indebtedness.	Value of real estate.	Value of personal property.	Permanent fund.
Massachusetts,	–	$2,430 50	–	–	$2,430 50	–	$10 00	$1,055 01	$1,065 01	–	–	$40,000 00	$40,000 00
Essex,	$600 00	586 30	$93 00	$1,139 74	2,416 13	$1,510 00	615 75	1,093 82	1,730 07	–	$6,000 00	1,000 00	8,003 31
Middlesex,	600 00	128 00	90 00	430 85	1,248 85	700 00	650 87	551 82	1,202 69	–	2,700 00	2,300 00	5,000 00
Middlesex North,	600 00	225 00	61 00	293 18	1,179 70	752 00	520 62	620 34	1,541 91	$2,200 00	6,614 24	473 00	6,614 24
Middlesex South,	600 00	24 00	49 00	485 00	1,158 00	1,124 50	538 63	487 80	1,026 43	3,067 55	7,000 00	1,500 00	8,500 00
Worcester,	600 00	–	1,704 00	1,263 00	3,567 00	1,588 50	462 71	453 74	3,132 24	5,500 00	18,000 00	600 00	13,100 00
Worcester West,	600 00	216 87	27 00	224 77	1,068 64	900 00	438 87	242 92	745 79	100 00	–	4,280 07	3,185 04
Worcester North,	600 00	267 00	45 00	239 42	1,151 51	1,059 25	643 31	338 45	981 76	–	–	1,710 64	4,510 64
Worcester South,	600 00	218 51	11 00	89 00	918 51	794 50	443 25	206 85	650 10	–	2,500 00	1,062 40	3,872 40
Worcester South-East,	474 30	124 20	365 00	313 59	1,277 09	798 00	435 46	650 32	1,085 78	–		3,000 04	3,000 04
Hampshire, Franklin and Hampden,	600 00	240 00	187 00	2,643 07	3,670 07	850 25	522 50	615 84	3,730 05	1,000 00	1,450 00	1,000 00	8,450 00
Hampshire,	600 00	330 46	93 00	1,151 32	2,111 78	1,005 00	477 70	510 77	2,191 43	274 46	4,122 18	1,050 31	4,122 18
Highland,	562 00	42 00	54 00	310 93	968 93	570 75	418 00	110 81	668 31	–	2,300 00	1,262 00	3,262 00
Hampden,	600 00		17 50	1,786 21	2,403 71	1,027 87	546 75	1,684 21	2,230 96	9,400 00	32,153 81	500 00	28,253 81

Hampden East,	300 00	121 02	73 50	285 12	839 64	578 00	381 42	118 00	529 12	150 00	–	1,950 00	1,950 00
Franklin,	600 00	66 60	30 00	900 00	1,596 60	780 00	600 00	–	1,500 00	–	3,000 00	450 00	3,400 00
Berkshire,	600 00	350 00	94 00	1,754 46	2,798 46	1,430 00	1,145 00	960 97	4,103 49	800 00	12,000 00	500 00	11,600 00
Housatonic,	600 00	628 40	55 00	2,002 29	3,285 69	928 00	812 00	2,132 21	2,911 31	3,100 00	8,600 00	150 00	11,500 00
Hoosac Valley,	401 00	100 30	96 00	321 00	918 30	582 00	449 50	393 24	812 74	–	–	–	2,000 00
Norfolk,	600 00	–	40 00	1,092 00	2,332 00	1,880 00	497 00	1,367 50	1,861 50	5,666 00	10,414 00	–	9,924 00
Bristol,	600 00	–	360 00	2,419 46	3,379 46	1,376 25	889 25	1,518 26	3,247 76	1,200 00	6,500 00	1,000 00	7,500 00
Plymouth,	600 00	532 03	117 00	2,095 24	3,344 93	1,702 00	1,347 86	1,180 00	3,083 10	3,090 85	18,500 00	1,000 00	19,500 00
Barnstable,	600 00	7 25	20 00	733 20	1,360 45	833 00	579 51	801 57	1,383 88	–	5,000 00	350 00	5,350 00
Nantucket,	405 70	502 70	23 75	539 36	1,271 51	488 00	254 75	628 42	1,071 42	400 00	2,137 20	800 00	5,237 20
Martha's Vineyard,	600 00	122 83	186 91	360 04	1,569 88	674 25	–	210 15	995 56	1,700 00	3,305 00	2,033 33	3,630 26
Totals,	$13,803 00	$7,392 81	$3,782 66	$23,502 16	$78,680 13	$23,963 30	$13,730 51	$18,090 15	$43,566 57	$38,198 86	$164,097 13	$74,980 38	$183,910 82

PERMANENT FUND—HOW INVESTED.

MASSACHUSETTS.—Bank stocks, Shattuck legacy, policies Mass. Life Office, and U. S. Treasury notes.
ESSEX.—Bank stocks, notes and railroad bonds.
MIDDLESEX.—Mortgages and bank and railroad stocks.
MIDDLESEX NORTH.—Real estate.
MIDDLESEX SOUTH.—Land and buildings, $7,000; pens, fixtures, &c., $900; notes, $600.
WORCESTER.—Real estate.
WORCESTER WEST.—Mortgages, notes and cattle pens.
WORCESTER NORTH.—Bank stocks, notes, cattle pens and fixtures.
WORCESTER SOUTH.—Agricultural hall, cattle pens, store house, fixtures, &c.
WORCESTER SOUTH-EAST.—Notes against town of Milford, cattle and swine pens, furniture.
HAMPSHIRE, FRANKLIN AND HAMPDEN.—Bond and mortgage notes, building, &c.
HAMPSHIRE.—Hampshire Hall and Park appurtenances and notes.
HIGHLAND.—Real estate, hall, office, personal property, sundries.
HAMPDEN.—Land and buildings.
HAMPDEN EAST.—Loans, fixtures, &c.
FRANKLIN.—Secured notes and loans.
BERKSHIRE.—Real estate.
HOUSATONIC.—Real estate and notes.
HOOSAC VALLEY.—In North Adams Savings Bank.
NORFOLK.—Real estate occupied by the society.
BRISTOL.—Farm and buildings.
PLYMOUTH.—Real and personal estate.
BARNSTABLE.—Land and buildings.
NANTUCKET.—Real estate and notes.
MARTHA'S VINEYARD.—Land, hall, notes, &c.

ANALYSIS OF PREMIUMS AND GRATUITIES AWARDED.

FOR FARMS, FARM IMPROVEMENTS, MANURES, &c.

SOCIETIES.	For management of farms.	For draining.	For subsoiling.	For ploughing at the Exhibition.	For reclaiming swamp lands.	For experiments with manures.	For spading.	For hedges and ornamental trees.	For reclaiming old pastures.	For orchards of all kinds.	For cranberries.	For other farm improvements.	Total amount offered for farm improvements.	Total amount awarded for farm improvements.	Total amount actually paid for farm improvements.
Massachusetts,	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Essex,	–	–	–	$96 00	–	$15 00	–	–	$10 00	–	$20 00	$20 00	$375 00	$175 00	$170 00
Middlesex,	–	–	–	66 00	–	–	–	–	–	–	–	–	76 00	66 00	66 00
Middlesex South,	–	–	–	14 00	–	–	–	–	–	–	–	–	126 00	14 00	14 00
Middlesex North,	–	–	–	40 00	$10 00	–	–	–	10 00	$23 00	10 00	12 00	158 00	93 00	93 00
Worcester,	–	–	–	72 00	–	–	–	–	–	–	–	–	102 00	–	–
Worcester West,	–	–	–	31 00	–	6 00	–	–	–	–	–	–	115 00	37 00	6 00
Worcester North,	–	–	–	54 00	–	–	$7 00	–	–	–	–	15 00	153 00	76 00	76 00
Worcester South,	–	–	–	47 00	–	–	–	–	–	–	2 25	–	247 00	49 25	49 25
Worcester South-East,	–	–	–	19 00	–	–	2 00	–	–	–	10 00	–	41 00	31 00	27 00
Hampshire, Franklin and Hampden,	–	–	–	–	–	–	–	–	–	–	3 50	150 00	163 00	3 50	3 50
Hampshire,	–	–	–	–	–	–	9 00	–	–	–	50	–	73 00	9 50	5 00
Highland,	$14 00	–	–	–	5 00	–	–	–	–	6 00	1 00	–	33 00	26 00	26 00
Hampden,	–	–	–	19 00	–	–	–	–	–	–	–	–	250 00	19 00	19 00
Hampden East,	–	–	–	–	5 00	–	–	$3 00	–	5 00	1 50	–	116 75	14 50	14 50
Franklin,	–	–	–	–	6 00	5 00	–	–	–	21 00	–	–	45 00	11 00	11 00
Berkshire,	–	–	–	48 00	10 00	–	7 00	–	–	10 00	–	–	79 00	25 00	25 00
Housatonic,	–	–	–	36 00	15 00	–	–	–	–	10 00	–	–	51 00	25 00	25 00
Hoosac Valley,	–	–	–	–	–	–	–	–	3 00	6 00	–	–	12 00	9 00	9 00
Norfolk,	–	–	–	72 00	10 00	–	16 00	–	15 00	–	7 00	–	520 00	126 00	133 00
Bristol,	–	–	–	53 00	–	–	–	–	–	25 00	–	–	102 00	78 00	78 00
Plymouth,	–	–	–	39 00	–	29 50	7 50	–	–	–	–	–	87 00	87 00	87 00
Barnstable,	15 00	–	–	16 00	–	10 00	–	–	10 00	5 00	6 75	–	62 75	62 75	62 75
Nantucket,	–	–	–	9 00	–	–	–	–	–	–	5 00	–	54 00	14 00	14 00
Martha's Vineyard,	–	–	–	–	–	–	–	–	–	–	12 00	6 00	18 00	–	–
Totals,	$29 00	–	–	$741 00	$61 00	$65 50	$48 50	$3 00	$48 00	$114 00	$80 50	$23 00	$408 63	$1,116 50	$1,045 00

FOR FARM STOCK.

SOCIETIES.	For Bulls.	For Milch Cows.	For Heifers.	For Calves.	For Working Oxen.	For Steers.	For Fat Cattle.	For Horses.	For Sheep.	For Swine.	For Poultry.	All other Stock.	Total amount offered for Live Stock.	Total am't awarded for Live Stock.	Total amount paid out for Live Stock.
Massachusetts,	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Essex,	$15 00	$23 00	$31 00	$8 00	$28 00	$13 00	$23 00	$74 00	$15 00	$24 00	$49 00	–	$409 00	$306 00	$236 00
Middlesex,	30 00	45 00	20 00	–	16 00	11 00	13 00	104 00	–	37 00	26 00	–	312 00	302 00	302 00
Middlesex North,	51 00	19 00	–	24 00	26 00	19 00	–	60 00	15 75	42 00	30 00	$10 00	387 00	297 75	297 75
Middlesex South,	48 00	16 00	25 00	30 00	21 00	14 00	18 00	127 00	–	38 00	30 50	–	414 00	397 50	336 50
Worcester,	43 00	57 00	63 00	–	56 00	65 00	31 00	269 00	28 00	39 00	25 00	–	787 00	676 00	–
Worcester West,	28 00	36 00	16 00	23 00	35 00	25 00	40 00	54 00	10 00	33 00	6 00	36 00	415 00	344 00	272 50
Worcester North,	31 00	22 00	44 00	7 00	20 00	33 00	37 00	87 00	10 00	35 00	19 50	–	428 50	345 50	311 50
Worcester South,	30 00	16 00	8 00	3 00	23 00	17 00	11 00	66 00	12 00	24 00	7 00	27 00	374 50	250 00	250 00
Worcester South-East,	20 00	39 00	3 00	2 00	23 00	16 00	8 00	81 00	–	35 00	6 50	–	272 00	240 50	150 50
Hampshire, Franklin and Hampden,	28 00	22 00	24 00	–	52 00	12 00	41 00	198 50	19 00	25 00	–	75 00	499 00	480 50	379 50
Hampshire,	38 00	10 00	9 00	15 00	20 00	20 00	3 00	210 00	13 00	17 00	9 00	–	512 00	384 00	327 00
Highland,	28 50	17 00	14 50	4 75	23 00	17 50	15 00	118 00	16 00	4 00	–	32 25	355 25	290 50	281 54
Hampden,	46 00	30 00	7 00	–	34 00	23 00	61 00	71 00	18 00	37 00	6 00	43 00	416 00	378 00	318 50
Hampden East,	13 00	9 50	5 00	4 00	19 25	6 25	9 00	53 25	16 00	16 00	9 00	–	201 25	160 25	133 00
Franklin,	34 00	32 00	16 00	9 00	20 00	45 00	20 00	30 00	90 00	60 00	25 00	10 00	530 00	440 00	433 00
Berkshire,	33 00	75 00	40 00	12 00	65 00	40 00	23 00	310 00	81 00	30 00	20 00	23 00	704 00	753 00	753 00
Housatonic,	35 00	20 00	22 00	6 00	40 00	28 00	11 00	94 00	63 00	21 00	6 00	47 00	388 00	391 00	390 00
Housac Valley,	6 00	27 00	17 00	7 00	19 00	19 00	6 00	139 00	33 00	8 00	17 00	–	304 00	283 00	277 00
Norfolk,	32 00	32 00	28 00	–	21 00	10 00	–	171 00	–	36 00	46 00	–	580 00	382 00	178 00
Bristol,	46 00	35 00	12 00	6 00	101 00	24 00	35 00	213 00	20 00	29 50	22 50	–	521 00	543 00	–
Plymouth,	40 00	32 00	17 00	23 00	39 50	27 75	49 80	204 75	47 00	45 00	15 00	–	617 00	635 00	494 69
Barnstable,	35 00	16 00	12 00	5 00	33 00	22 00	52 00	25 00	21 00	29 00	13 00	32 00	321 00	295 00	245 00
Nantucket,	7 00	5 00	8 00	–	7 00	5 00	–	42 00	6 00	13 00	11 00	–	180 00	101 00	104 00
Martha's Vineyard,	4 00	8 00	9 00	–	15 00	2 00	27 00	29 00	23 00	7 00	4 00	–	185 50	128 00	–
Totals,	$784 50	$643 50	$395 50	$191 75	$708 75	$516 50	$553 80	$2,352 50	$556 75	$721 50	$387 00	$336 25	$9,052 00	$8,551 50	$6,602 98

* Not having received the State Bounty until a late date, but a small portion of the premiums awarded have been paid out: therefore the omission of items under the head of total amounts actually paid out.

ANALYSIS OF PREMIUMS AND GRATUITIES AWARDED.—Concluded.

FOR FARM PRODUCTS.

SOCIETIES.	Indian Corn.	Wheat.	Rye.	Barley.	Oats.	Beans.	Grass Crops.	Grass Seeds.	Potatoes.	Carrots.	Beets.	Parsnips.	English Turnips.	Ruta-Bagas.	Onions.	other Root Crops.
Massachusetts,	–	–	–	–	–	–	–	–	–	$25 00*	–	–	–	–	–	–
Essex,	$10 00	$5 00	–	–	–	–	–	–	–	–	$5 00	–	$8 00	–	$8 00	$8 00
Middlesex,	5 00	5 00	–	$3 00	–	–	–	–	–	–	–	–	–	$36 00‡	–	–
Middlesex North,	25 00	13 00	–	–	–	–	–	–	30 75	–	–	–	–	–	–	–
Middlesex South,	–	–	–	–	–	–	$21 00	–	–	–	–	–	–	–	–	–
Worcester,	2 00	4 00	$4 00	2 00	$0 50	$2 00	–	–	7 00	–	3 00	–	–	–	–	$3 00
Worcester West,	6 00	4 00	–	–	–	–	–	–	4 25	25	–	–	–	–	50	50
Worcester North,	19 13	10 00	–	–	–	1 25	–	$3 00	6 25	–	1 50	–	1 38	–	25	$2 00
Worcester South,	10 50	–	–	4 00	–	–	–	–	1 50	–	6 00	–	6 50	–	–	–
Worcester South-East,	10 00	6 00	7 00	2 00	–	–	–	–	4 00	5 00	4 00	$2 00	4 00	–	–	–
Hampshire, Franklin and Hampden	–	10 00	1 00	–	1 00	1 00	–	4 00	12 00	4 00	1 00	–	1 00	4 00	1 50	8 00
Hampshire,	6 00	6 00	1 00	–	1 00	–	–	1 00	1 00	1 00	–	–	1 00	1 00	1 00	6 00
Highland,	7 00	–	–	–	4 00	–	3 00	1 00	4 00	5 00	–	–	2 00	5 00	–	–
Hampden,	–	–	–	–	–	–	–	6 00	3 00	–	–	–	–	–	–	–
Hampden East,	1 42	4 17	3 42	75	1 25	–	–	2 50	50	50	75	1 00	50	2 00	–	–
Franklin,	6 00	5 00	–	–	–	–	–	–	–	3 00	–	–	3 00	2 00	–	–
Berkshire,	–	–	–	–	–	–	–	–	3 00	–	–	–	–	–	–	–
Housatonic,	38 00	12 00	15 00	–	18 00	3 00	5 00	11 00	16 00	6 00	5 00	5 00‡	1 00	–	–	–
Hoosac Valley,	9 00	7 00	8 00	6 00	7 00	–	–	17 00	6 00	2 00	–	–	–	–	–	–
Norfolk,	8 00	6 00	–	–	–	–	–	–	5 00	–	–	–	–	–	–	17 00
Bristol,	24 00	6 00	–	–	–	–	–	–	–	5 00	5 00	–	5 00	6 00	3 00	11 25
Plymouth,	11 00	13 00	13 00	8 00	13 00	13 00	–	–	12 00	8 00	–	–	–	12 00	–	–
Barnstable,	14 00	–	10 00	–	5 00	–	–	–	5 00	12 00	–	–	5 00	–	–	–
Nantucket,	13 00	8 00	–	–	–	3 00	–	–	–	4 00	2 00	–	–	–	–	–
Martha's Vineyard,	27 00	7 25	–	–	11 37	3 00	–	–	1 75	4 00	2 25	–	2 25	–	2 00	3 00
Totals,	$288 05	$141 12	$82 42	$25 75	$65 12	$26 25	$2 00	$42 50	$111 00	$203 75	$85 50	$8 00	$43 63	$8 00	$19 50	$129 63

* Imported seed. † Cabbages. ‡ All root crops. § Vegetables. ‖ Buckwheat. a Messina Wheat and Rye.

FARM PRODUCTS—Concluded.

SOCIETIES.	Total amount offered for Grain & Root Crops.	Total amt awarded for Grain & Root Crops.	Total amt paid for Grain and Root Crops.	Broomcorn Brush.	Fruits.	Flowers.	Any other cultivated Crops.	Milk.	Butter.	Cheese.	Honey.	Wheat Bread.	Rye and Indian Bread.	Corn Bread.	Total amt paid out under the head of Farm Products.
Massachusetts,	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Essex,	$130 00	$17 00	$17 00	–	$100 00	$25 00	$38 00	–	$18 00	$10 00	$5 50	–	$4 50	–	$168 00
Middlesex,	50 00	49 00	49 00	–	121 50	27 00	–	–	20 00	–	–	$11 00	3 00	–	231 50
Middlesex North,	152 00	68 75	68 75	–	–	65 00	–	–	14 00	–	–	–	18 00	–	136 75
Middlesex South,	98 00	24 00	24 00	–	50 25	19 00	–	–	15 00	–	10 50*	5 00	5 00	–	143 75
Worcester,	–	–	–	–	2 00	15 50	–	–	28 00	32 00	–	4 00	2 00	–	–
Worcester West,	55 00	10 00	6 00	–	17 50	13 00	4 25	–	7 00	41 00	–	6 00	4 00	–	[illegible]
Worcester North,	115 00	43 64	40 89	–	51 63	3 62	22 50	–	15 00	2 50	3 50	4 50	3 00	–	132 11
Worcester South,	53 00	28 25	28 25	–	26 25	10 50	–	–	9 00	9 00	–	4 50	3 50	–	91 00
Worcester South-East,	73 00	42 00	38 00	–	35 00	6 00	30 75	–	13 00	6 00	2 00	4 50	2 50	–	134 50
Hampshire, Franklin and Hampden,	95 00	35 00	28 00	$6 00	42 50	9 00	17 00	–	10 00	5 00	2 00	4 50	3 50	–	127 50
Hampshire,	78 00	26 00	21 50	1 00	20 00	7 00	5 00	–	6 00	5 00	3 00	3 00	2 00	$2 00	69 50
Highland,	53 00	31 00	31 00	–	8 50	1 25	7 50	$3 50	6 50	6 50	1 00	50	50	50	67 25
Hampden,	148 00	9 00	9 00	–	54 00	1 50	50 00	–	18 50	22 50	7 00	1 50	1 50	1 50	130 00
Hampden East,	50 00	22 76	–	–	1 25	1 95	10 25	–	5 50	5 00	1 50	25	1 00	–	–
Franklin,	84 00	19 00	19 00	–	28 00	4 00	–	9 00	9 50	10 00	5 00	2 00	4 00	–	68 00
Berkshire,	215 00	24 00	24 00	–	28 00	7 00	10 00	29 00	21 00	26 00	3 00	6 00	3 00	3 00	160 00
Housatonic,	152 00	145 50	145 50	–	15 00	12 00	30 00	–	15 00	15 00	1 00	1 50	3 00	–	218 00
Housac Valley,	115 00	62 00	50 00	–	–	17 00	–	–	9 00	9 00	6 00	3 00	3 00	3 00	101 00
Norfolk,	129 00	36 00	39 00	–	24 00	34 00	–	–	21 00	–	–	15 00	5 00	–	146 00
Bristol,	228 00	54 00	54 00	–	72 75	11 25	–	–	26 00	15 00	15 00	6 00	5 50	7 00	358 75
Plymouth,	236 00	120 00	81 50	–	–	20 25	–	–	33 00	23 00	–	5 75	5 75	–	2 50
Barnstable,	94 00	41 00	41 00	–	18 75	20 48	32 55	–	10 00	5 00	–	6 00	6 00	6 00	145 78
Nantucket,	133 00	31 00	31 00	–	24 00	6 75	–	–	10 00	–	3 00	50	–	–	75 25
Martha's Vineyard,	138 00	64 12	–	–	12 25	6 00	–	–	10 00	5 00	–	3 00	2 25	–	–
Totals,	$2,692 00	$1,033 02	$876 80	$7 00	$737 13	$415 05	$266 80	$41 50	$324 00	$252 50	$69 00	$98 00	$88 50	$21 00	$2,870 05

* Jellies, preserves, &c. † Garden vegetables, maple sugar, seed-corn. ‡ See note under head of Farm Stock.

§ Amount paid out for Cheese, $3; Fruit, $9.75; Flowers, $7; Bread, $3; Grain, $8; being for Premiums awarded in 1860.

MISCELLANEOUS.

SOCIETIES.	Amount awarded for agricultural implements.	Amount offered for raising forest trees.	Amount awarded and paid out for the same.	Am't offered for experiments on manures in accordance with the requirements of the board, payable in '72.	Am't awarded for all other objects specified, not specified before.	For mechanical inventions, labor-saving machines, &c.	Number of persons who received premiums & gratuities.
Massachusetts,	–	$1,000 00	–	$500 00	–	–	1
Essex,	$14 00	30 00	–	60 00	–	$17 00	295
Middlesex,	16 00	–	–	60 00	–	37 87	253
Middlesex North,	–	–	–	60 00	–	20 00	236
Middlesex South,	9 50	70 00	–	60 00	$1 75	37 20	260
Worcester,	20 00	22 00	–	60 00	–	22 00	174
Worcester West,	11 00	20 00	–	60 00	–	50 00	149
Worcester North,	8 00	50 00	–	75 00	–	100 47	255
Worcester South,	–	37 00	–	75 00	7 00	45 00	147
Worcester South-East,	10 00	30 00	–	60 00	–	73 00	223
Hampshire, Franklin and Hampden,	–	20 00	–	30 00	–	93 00	266
Hampshire,	11 00	10 00	–	48 00	–	105 67	224
Highland,	–	–	–	45 00	–	40 25	134
Hampden,	7 00	25 00	–	45 00	–	70 15	127
Hampden East,	2 25	10 00	–	60 00	–	37 02	75
Franklin,	16 00	10 00	–	–	–	52 00	173
Berkshire,	16 00	–	–	60 00	–	141 00	270
Housatonic,	7 00	–	–	45 00	5 00	158 00	195
Hoosac Valley,	–	–	–	–	7 00	55 50	186
Norfolk,	5 00	30 00	–	60 00	–	58 00	146
Bristol,	–	45 00	$40 00	60 00	–	131 00	340
Plymouth,	7 50	60 00	–	60 00	–	176 50	456
Barnstable,	–	8 00		60 00	–	75 78	274
Nantucket,	50	18 00	–	60 00	15 00	45 00	55
Martha's Vineyard,	3 00	40 00		60 00	–	87 28	180
Totals,	$162 75	$1,583 00	$40 00	$1 623 00	$35 75	$1,800 82	5,034

Names of the Towns and Cities to which the Premiums and Gratuities were disbursed, and the amount to each.

MASSACHUSETTS.

Concord,	$10 00

ESSEX.

Andover,	$9 00	Manchester,	$19 50
Beverly,	24 50	Marblehead,	45 00
Boxford,	12 00	Methuen,	5 00
Cambridge,	10 00	Middleton,	14 50
Danvers,	89 50	Newbury,	65 00
Essex,	2 95	Newburyport,	8 00
Georgetown,	1 00	North Andover,	56 00
Gloucester,	1 00	Salem,	96 00
Groveland,	10 00	South Danvers,	3 00
Hamilton,	6 00	Swampscott,	208 50
Haverhill,	12 00	Topsfield,	20 50
Ipswich,	4 50	Wenham,	5 50
Lawrence,	4 50	West Newbury,	60 75
Lowell,	50	Unknown,	8 00
Lynn,	25 00	Total,	$836 00
Lynnfield,	9 00		

MIDDLESEX.

Acton,	$47 00	Billerica,	$2 00
Bedford,	11 00	Boston,	3 00
Belmont,	22 00	Boxborough,	2 00

MIDDLESEX—Concluded.

Brighton,	$4 00	Pepperell,	$10 00
Cambridge,	50	Stow,	1 00
Carlisle,	11 50	Sudbury,	14 25
Chelmsford,	25 25	Wayland,	33 50
Concord,	291 12	Waltham,	14 50
Dracut,	10 00	West Cambridge,	10 00
Framingham,	50 25	Westford,	50
Hopkinton,	1 00	Weston,	8 50
Lexington,	8 00	Wilmington,	7 50
Lincoln,	27 50	Winchester,	4 00
Littleton,	8 00	Woburn,	15 00
Marlborough,	6 00	Total,	$611 87
Newton,	2 00		

MIDDLESEX NORTH.

Billerica,	$10 25	North Reading,	$18 00
Chelmsford,	101 87	Tewksbury,	29 00
Dracut,	40 75	Tyngsborough,	45 50
Dunstable,	79 00	Westford,	14 50
Littleton,	5 00	Wilmington,	23 00
Lowell,	150 66	Total,	$517 52

MIDDLESEX SOUTH.

Ashland,	$15 00	Marlborough,	$12 00
Framingham,	318 09	Natick,	66 52
Holliston,	32 74	Sherborn,	21 25
Hopkinton,	15 50	Southborough,	41 25

MIDDLESEX SOUTH—Concluded.

Sudbury,	$12 25	Out of the District,	$21 50
Wayland,	55 50	Total,	$611 70

WORCESTER.

Auburn,	$2 00	Northborough,	$7 00
Barre,	33 00	Oxford,	2 00
Berlin,	6 00	Paxton,	5 50
Bolton,	4 00	Princeton,	24 00
Boylston,	8 00	Rutland,	7 00
Charlton,	32 00	Shrewsbury,	32 75
Grafton,	44 50	Sutton,	66 25
Hardwick,	6 00	Southborough,	40 00
Holden,	33 00	Southbridge,	10 00
Leicester,	26 50	Sterling,	9 00
Millbury,	58 00	Westborough,	74 00
Milford,	11 00	West Boylston,	41 00
Millville,	75	Worcester,	334 25
New Braintree,	12 00	Total,	$942 00

WORCESTER WEST.

Barre,	$280 37	Petersham,	$20 00
Charlton,	19 00	Phillipston,	6 00
Dana,	75	Princeton,	15 00
Gardner,	50	Rutland,	50
Hardwick,	69 00	Templeton,	15 75
Hubbardston,	20 25	West Brookfield,	3 00
New Braintree,	33 50	Worcester,	3 00
North Brookfield,	3 00	Total,	$502 87
Oakham,	6 00		

WORCESTER NORTH.

Ashburnham,	$18 00	Phillipston,	$17 00
Ashby,	21 50	Princeton,	71 00
Dracut,	3 00	Royalston,	10 00
Fitchburg,	390 96	Shirley,	8 00
Gardner,	1 25	Spencer,	50
Leominster,	11 00	Westminster,	48 35
Littleton,	10 00	Winchendon,	4 00
Lunenburg,	33 75	Worcester,	75
Natick,	25	Total,	$643 31
Pepperell,	2 00		

WORCESTER SOUTH.

Brimfield,	$17 12	Spencer,	$2 50
Brookfield,	12 75	Southbridge,	56 27
Charlton,	63 87	Sturbridge,	207 49
Dudley,	36 25	Warren,	41 00
Holland,	1 00	West Brookfield,	50
Leicester,	2 00	Total,	$143 25
North Brookfield,	50		

WORCESTER SOUTH-EAST.

Blackstone,	$6 00	Milford,	$235 14
Foxborough,	50	Northbridge,	5 00
Franklin,	1 50	Upton,	18 50
Grafton,	5 00	Uxbridge,	20 00
Holliston,	8 00	Worcester,	12 00
Hopkinton,	42 25	Total,	$435 46
Mendon,	75 50		

HAMPSHIRE, FRANKLIN AND HAMPDEN.

Amherst,	$2 00	Montgomery,	85 00
Charlemont,	4 00	Northampton,	208 25
Chesterfield,	2 50	Prescott,	2 00
Chicopee,	18 00	Shelburne,	3 00
Conway,	3 00	Southampton,	29 00
Cummington,	5 00	South Hadley,	60 00
Easthampton,	23 00	South Deerfield,	15 00
Granby,	21 50	Springfield,	16 25
Greenfield,	1 00	Sunderland,	17 00
Goshen,	5 75	Westfield,	40 00
Hadley,	96 25	Westhampton,	12 75
Hatfield,	91 50	Whately,	9 75
Huntington,	50	Worthington,	4 00
Holyoke,	7 00	Williamsburg,	10 00
Leverett,	50	Total,	$715 50
Middlefield,	2 00		

HAMPSHIRE.

Amherst,	$172 99	Leverett,	88 51
Barre,	1 00	Northampton,	1 38
Belchertown,	64 00	Palmer,	1 50
Chicopee,	5 00	Pelham,	28 75
Deerfield,	1 50	Pittsfield,	4 00
Enfield,	15 00	South Hadley,	4 00
Greenfield,	23 00	Sunderland,	65 45
Hadley,	73 62	Worcester,	1 50
Hardwick,	6 50	Total,	$477 70

HIGHLAND.

Becket,	$101 75	Northampton,	$2 00
Blandford,	5 50	Otis,	3 00
Chester,	31 25	Palmer,	3 00
Chesterfield,	2 60	Peru,	31 50
Cummington,	50	Pittsfield,	3 50
Hinsdale,	32 00	Springfield,	11 50
Lanesborough,	12 00	Washington,	10 50
Lee,	5 00	Worthington,	16 00
Middlefield,	144 00	Total,	$418 00

HAMPDEN.

Agawam,	$3 75	Palmer,	$7 50
Blandford,	9 00	Southwick,	9 75
Brimfield,	6 00	Springfield,	137 00
Chester,	2 00	Westfield,	57 00
Chicopee,	76 50	West Springfield,	73 50
Holyoke,	25 50	Wilbraham,	$100 00
Longmeadow,	24 75	Total,	$546 75
Ludlow,	14 50		

HAMPDEN EAST.

Belchertown,	$4 00	Ware,	$4 00
Brimfield,	20 00	Warren,	14 00
Ludlow,	1 25	Wilbraham,	28 00
Monson,	3 90	Total,	$270 57
Palmer,	115 42		

FRANKLIN.

Bernardston,	$12 50	Leverett,	$5 00
Colrain,	15 25	Montague,	15 50
Conway,	18 50	Northfield,	14 00
Deerfield,	66 00	Shelburne,	213 75
Gill,	12 00	Sunderland,	15 00
Greenfield,	141 00	Whately,	5 00
Hadley,	6 00	Worcester,	2 00
Heath,	8 50	Total,	$592 75
Leyden,	12 75		

BERKSHIRE.

Adams,	$80 00	Peru,	$10 00
Becket,	17 00	Pittsfield,	285 00
Cheshire,	56 00	Richmond,	33 00
Dalton,	51 00	Sheffield,	13 00
Egremont,	7 00	Stockbridge,	77 00
Great Barrington,	33 00	Washington,	5 00
Hancock,	9 00	West Stockbridge,	1 00
Hinsdale,	18 00	Williamstown,	18 00
Lanesborough,	170 00	Windsor,	10 00
Lee,	60 00	Total,	$1,145 00
Lenox,	142 00		

HOUSATONIC.

Alford,	$26 00	Great Barrington,	$267 50
Becket,	13 00	Lee,	37 50
Egremont,	109 50	Lenox,	56 50

HOUSATONIC—Concluded.

Monterey,	$26 00	Sheffield,	$109 50
New Marlborough,	10 00	Stockbridge,	91 50
Pittsfield,	13 50	Tyringham,	6 00
Richmond,	18 00	West Stockbridge,	22 50
Sandisfield,	5 00	Total,	$702 00

HOOSAC VALLEY.

Blackstone,	$28 50	Savoy,	$10 00
Cheshire,	25 50	South Adams,	55 00
Clarksburg,	16 50	Stamford,	8 00
Florida,	33 00	Williamstown,	89 00
North Adams,	167 00	Windsor,	2 00
Pittsfield,	5 00	Total,	$119 50
Pownall, Vt.,	10 00		

NORFOLK.

Brookline,	$82 00	Needham,	$103 00
Canton,	18 50	Randolph,	2 00
Dedham,	182 00	Roxbury,	25 50
Dorchester,	75 00	Sharon,	17 00
Dover,	55 00	Stoughton,	27 00
Foxborough,	36 00	Walpole,	6 00
Franklin,	27 00	West Roxbury,	15 00
Medfield,	8 00	Wrentham,	25 00
Medway,	9 00	Total,	$690 00
Milton,	27 00		

BRISTOL.

Acushnet,	$1 00	Pawtucket,	$1 50
Attleborough,	68 50	Rehoboth,	31 50
Berkley,	22 00	Raynham,	210 75
Dighton,	12 00	Somerset,	19 00
Easton,	23 50	Seekonk,	3 25
Fall River,	15 00	Taunton,	534 50
Mansfield,	12 25	Westport,	1 00
New Bedford,	22 00	Total,	$1,120 75
Norton,	143 00		

PLYMOUTH.

Abington,	$30 00	Mattapoisett,	$26 88
Boston,	2 00	Middleborough,	192 75
Bridgewater,	386 21	New Bedford,	2 00
Canton,	1 00	North Bridgewater,	112 63
Carver,	14 50	Pembroke,	36 50
Duxbury,	9 00	Plymouth,	68 80
East Bridgewater,	138 30	Plympton,	20 00
Halifax,	42 88	Rochester,	4 25
Hanover,	10 00	Somerset,	1 00
Hanson,	35 75	Stoughton,	1 00
Hingham,	6 50	Taunton,	1 00
Kingston,	26 00	West Bridgewater,	108 06
Lakeville,	73 64	Total,	$1,352 65
Marshfield,	2 00		

BARNSTABLE.

Barnstable,	$130 30	Harwich,	$5 50
Brewster,	3 00	Orleans,	11 62
Chatham,	9 00	Provincetown,	25
Dennis,	15 12	Sandwich,	48 00
Eastham,	3 00	Yarmouth,	49 50
Falmouth,	4 00	Total,	$579 31

NANTUCKET.

Nantucket,	$254 75

MARTHA'S VINEYARD.

Edgartown,	$28 38	Chilmark,	$98 32
Tisbury,	133 08	Total,	$259 78

INDEX

TO THE SECRETARY'S REPORT.

ABSTRACT OF RETURNS

OF THE

AGRICULTURAL SOCIETIES

OF

MASSACHUSETTS,

FOR

1861.

EDITED BY

CHARLES L. FLINT,

SECRETARY OF THE STATE BOARD OF AGRICULTURE.

BOSTON:

WILLIAM WHITE, PRINTER TO THE STATE.

1862.

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AGRICULTURE OF MASSACHUSETTS.

EDUCATION OF FARMERS' SONS.

From an Address before the Essex Agricultural Society.

BY ALFRED A. ABBOTT.

How should farmers' sons be educated—how should the rising generation of farmers be reared?

In order to insure success in any department of life or labor, there must be the previous suitable preparation and training. If a lad is intended for one of the professions, so-called, he starts with that understanding. There is from the outset method and system. He is put to those exercises which it is believed will best discipline his mind for the peculiar labors he is to perform. All those means and appliances are brought to bear which can aid in developing the faculties and powers upon which hereafter he must mainly rely. The whole field of his future is brought and kept before him, so that all through his preparatory course he can have in view the goal for which he has set out. And if, after all, he fails, as many do, (for it is hardly necessary to say that there are incapable lawyers, unskilful physicians and inefficient ministers, as well as thriftless farmers,) the fault is in himself, and not in the system. So, if a boy is intended for mercantile life or some mechanical pursuit, he is trained for that life or pursuit, and his training begins with the knowledge on his part that he has entered upon what is to be his future, permanent occupation—that he has embarked upon the voyage of life, and as he steers his course and trims his sails, so will come success or failure. Henceforth

he has one governing thought, one aim, and to that every thing is subordinate. From the first, every thing tends to give him a full and clear idea of his chosen business, its duties and its difficulties, and what he must do to secure its amplest rewards and achieve its highest triumphs.

Now, how is it with the education of farmers? There are exceptions, of course, but not enough to disturb the general rule. The farmer sends his son to the village school, where he learns to read and write and cipher. He is set to do the light chores about home, until, gaining in strength, he is put to harder tasks. As he grows up, he learns to plant, to mow, to harvest, to perform the ordinary work of the farm, but only in the way he sees his father perform these labors. He may or may not observe the rotation of crops, the application of particular fertilizers, the production of certain results, but if he does, he knows not, thinks not, of the reason of the thing. To all intents and purposes, he is performing a mere mechanical task. Whether or not he is to be a farmer, whether that is to be the business of his life, remains undetermined. Neither he nor his father have come to any settled understanding upon this. Like Mr. Micawber, he is waiting for something to turn up,—some opportunity to go to the city, to go to sea, to go into trade,—but all the time with mind unfixed, with no clear purposes, no distinct aims. If he remains upon the farm and becomes a farmer, the chances are that he does it from the force of circumstances, and because that seems to be the only resource left him, and not from choice. And then he goes on as he began, and as his father has gone before him. Now what is needed is, and it is of primary importance, that the young novitiate for farming should be trained to his business, with the understanding from the first that it is to be his business—one in which he is to earn his living and acquire a competency; one in which, from the start, he shall be spurred on by the laudable ambition to excel and make his mark. Why should there not be in this the same method and system as in other employments? Why should he not begin with the idea which is to control his course, so that every effort and every experience may be made to tell in his general education and to bear upon final results? The boy upon the farm, who is to be a farmer, when he has had the proper rudimentary education of the schools, should commence

his profession in earnest, knowing and feeling that he has commenced it. If he is put to any particular farm-work, he should understand why that work is to be done, and why at that time, and if told to do it in a particular way, he should understand why it is to be done in that rather than in a different way. He should be led to inquire the reason of and for every thing, to think and judge, to read and study, to learn theory and practice together, and test the former by the latter. In this mode, and in this only, can he commence his career with the same advantages which attend the young man entering upon any other kind of business. It is generally the first step in life which gives direction to its whole future march. It is the resolution early formed which imparts courage to youth and strength to manhood. Let the young farmer have but a fair start, and he need not ask any odds.

In the next place, and of equal, and perhaps greater importance, the young man who is to become a farmer should at once feel and realize that the occupation upon which he is entering is not a mere mechanical routine of labor; that while it is one which may require severe physical toil, it also calls for and demands the exercise of the highest intellectual faculties. How absurd is the idea that the brightest boy in a family must be sent to school and college, and trained up as a merchant or professional man, while his brother, not thought fit for any thing else, will do to make a farmer of. While the father thinks so, the sons of course imbibe the same notion, and this shallow fallacy of thought hardens into real and disastrous fact, and the result is, that just what is most needed to encourage, improve, ennoble this great fundamental art and science of life, to wit, *intelligence*, *mind*, are withdrawn from it to be expended upon other pursuits. And this idea so acted upon, while it tends to draw many of our best young men from the farm, has also this bad result, that it depresses and discourages those who are left, and leads them to believe that farming is mere drudgery, —that they must work harder, fare poorer, be worse paid, and pass less pleasant and happy lives than their fellows who pursue other employments. Now, do you believe that God put man in the Garden of Eden, "to dress it and to keep it,"—that from thence he was sent forth "to till the ground," and was told, "in the sweat of thy face shalt thou eat bread till thou return

unto the ground,"—that in His providence it was ordered that the great majority of mankind should cultivate the soil, while the whole race should thus be fed,—that to the moral, political and social elevation of man, as well as to the full and healthy development of his physical powers, agriculture should be necessary and essential, and yet that it should give no scope for the exercise of his intellectual faculties, of that "living soul" which he became when God "breathed into his nostrils the breath of life?" No; here, as everywhere else, "wisdom is strength and knowledge is power." Why is there such a difference; what causes the disparity in the condition of farmers? Why are not all alike prosperous? Why is that this farm is fertile and productive, and its owner prosperous and happy, while the one which adjoins it is sterile and unfruitful, and its owner an unsuccessful and disappointed man? There is no natural or irremediable difference in soil or climate. There is the same health and strength and muscle in the men. The sun shines as genially, the rain descends as seasonably, the dew falls as gratefully for one as for the other. It is because in addition to more diligence and economy, and perhaps to more industry, one brings to his work more judgment, more intelligence, more mind, than the other.

The farmer should be the last man to have inadequate conceptions of his mission, the last to disparage it. As a man thinketh so he is, and so will he do. "*Possunt quia posse videntur.*" We are able when we have faith in our ability. If farmers generally consider their calling ignoble and low; that it is mere bodily toil, a sullen contest of animal strength with inert matter; that they are but hewers of wood and drawers of water, so will it be and such will they become. But if, on the other hand, they have just and true ideas of themselves and their vocation; that it is elevated and ennobling; that not only are they with strong hands to wage successful war against brute forces, but that ripe with intelligence they are to share in the triumphs of mind over matter, then will they and all things around them be transformed. They will walk the earth with a more elastic step. The very grass beneath their feet will wear a livelier green. The blue sky above their heads will bend more brightly. The summer breezes will whisper new hopes. The winter storms will inspire fresh courage. Thinking, reasoning, as well

as working men, with cultivated minds and aspiring souls, they will respect themselves and be respected by others; they will dignify and adorn labor; they will feel and know, and the world will see how enviable and exalted is their position, and that with the farmer's lot there is none which can compare for real happiness and solid good.

Having started, then, to become a farmer, not with a sort of floating idea that such may possibly be his permanent business, but, in the first place, with a fixed and well-defined purpose, and, in the second place, with a correct idea of the nature and importance of the business, and what it imperatively demands for full success—the young farmer is ready to go to work, or rather he is ready to learn how to work, to serve his apprenticeship, to fit himself for the duties of life. In truth, this preparation is to last his whole lifetime. Whoever has to deal with nature and her processes, is a perpetual learner. He studies in a school whose lessons are never completed, whose teachings have no end. The great forces and the very elements are his instructors. Each rolling year, each passing season, unfold new problems to be solved, new mysteries to be fathomed, and the scholar, as he grows wise, grows humble, for he realizes how infinite is the wisdom of the Creator, how wondrous are his ways. And when death ends his labors, and he goes down to rest in the bosom of the earth he has lived upon and loved so long, it is with the humility and yet with the faith of a child, that in another state of being, where the vision will be clearer and the soul unfettered, he will pursue his studies and gain truer views, as he basks in the light of infinite knowledge.

But how shall the young farmer prosecute his work? Of course industry is to be inculcated,—unfailing, never-tiring, which finds for every hour some work to do, and without which nothing can be accomplished. Economy, too, which allows no waste or extravagance, which saves the little here and the little there, which accumulates, earns, produces, before it spends and consumes, which is the handmaid of industry and the foundation of wealth. Habits of order, also, should be impressed, which for every labor has its time, which never puts off till to-morrow what can as well be done to-day, which has a place for every thing and keeps every thing in its place,—that order or system, which although it may seem more natural to some than to

others, is yet the result of discipline, and can be cultivated and acquired by all,—which is as necessary upon the farm as in the office or workshop, and the practice or neglect of which may be, and often is, the turning point between success and failure.

In this connection, a word upon the keeping of accounts would not seem to be out of place. I do not speak now of farm accounts, technically so called,—the account which every farmer should keep with every department of his farm, without which it is impossible to calculate the most beneficial mode of its management, and the improvements of which it is susceptible, and which is just as important to him as to the merchant or manufacturer are their complicated books. And yet, if there were time, it would be a profitable theme. For illustration, suppose a farmer should say to his son who is training to succeed him, "Here, take this lot of land, cultivate it, experiment upon it, do with it and what you get from it as you please, but keep a strict account with it, and from year to year, see not only what you have learned of farming, but how stands the matter of profit and loss. To say nothing of what an incentive this would be to effort, what a spur to youthful ambition, how better could the young man be taught prudence and thrift, while at the same time he was gaining golden knowledge of his art? And thus from this one lot let the same system be applied to all, to the whole farm, whenever he comes to have one of his own. But I was referring to the subject in a more limited view, to the accounts which a farmer should keep of his pecuniary transactions—of his bargains, and purchases, and sales, his dealings with the world. I feel that I have a right to speak of this with some degree of confidence, because it is a matter with which my own professional experience has made me somewhat familiar. I have known instances, and they have not been infrequent, where a farmer, forced to go into court, has been unable to prove an honest demand, simply from his inability to produce an account-book which would meet the easy requirements of the law, and who, besides losing his case, and having to pay a heavy bill of costs to his fraudulent debtor, has gone home mortified at the thought that his neighbors would believe he was in the wrong and his opponent in the right. The looseness which prevails in this matter strikes every lawyer with astonishment. The usual apology made is, that a farmer's dealings are mainly

cash, and that he has little occasion to be particular about his accounts. This is comparatively true. But while a farmer is to be encouraged in never buying but for cash, there are times when in selling he must accommodate his neighbor with credit. And so, in this and other ways, it happens that there is not a week, hardly a day in the year, in which there should not be some memorandum made, some charge, some credit, something in the end involving dollars and cents. It is no kook-keeping by double entry, no complicated system of accounts that is required. The law in this respect is liberal. An old barn door, with its chalk scores, unhung and brought into court, would be allowed to justify a suppletory oath. But barn doors and kitchen ceilings are unsafe and clumsy journals. Paper and pen and ink are much more trustworthy and quite as convenient. All that is wanted is ordinary penmanship, a knowledge of the simplest rules of arithmetic, and that habit of punctuality which will record the transaction at the time of its occurrence. If the farmer is advanced in years, and his hands cramped by toil, let him use the nimbler fingers of his wife or daughter, only let him have the account kept. But let his son, when he begins farming, start fair in this respect, and accustom himself to keep his accounts regularly and correctly. It will not only save him money, it will save him much annoyance, vexation and strife. It may be said that this is a small matter. Be it so. "Take care of the little things, and the large ones will take care of themselves,"—or, as the tradesman has it, and he knows the value of poor Richard's maxim, "Take care of the pence, and the pounds will take care of themselves." It has been said by good authority, "More *profit* is made on a farm from trifles than from the large crops." The sooner the young man learns this invaluable lesson, the better will be his chances of success. The Dutch have a proverb, "No one is ever ruined who keeps good accounts." They will not only enable a man to understand his whole affairs, and avoid being cheated, but their moral effect is important;—they prevent habits of irregularity, procrastination and indolence; they induce habits of order, promptness and industry.

Among those things which attract the attention of an outside observer, there is no one which so excites his surprise as the indifference manifested by farmers in availing themselves of the

aids furnished to successful culture by improved instruments of labor and by modern scientific research. Although as to the former, there has, of late years, been a great and growing change, and men who but recently looked with distrust and aversion upon what they called new-fangled inventions, will now cheerfully use, and, if they cannot afford to buy, will hire one and another of those valuable labor-saving implements, which are doing so much to facilitate the operations of the farm, yet there is still room for progress. In this matter the young farmer should begin with the right ideas. While he listens to the advice of his elders, and pays due respect to their example as well as precept, he should guard against becoming the slave of old prejudices, and should observe, and judge, and act for himself. To say that because his father before him managed to cut and cure and get in his hay with a scythe and fork and hand-rake, therefore there is no need of his using a mowing-machine, a tedder, or a horse-rake, is just as absurd as it would be for him never to ride in a rail-car, wear a cloth coat, or eat flour bread, because his grandfather jogged along on horseback, was comfortable in linsey-woolsey, and didn't starve on rye and Indian. Of course he must exercise prudence and caution, and neither go beyond his means nor lightly adopt every new contrivance simply because it is new. But on the other hand, let him studiously avoid that spirit of distrust which looks with suspicion upon every departure from old usage. Let him, with eyes wide open to see, and mind open to conviction, carefully observe and narrowly watch, and then adopt whatever full experiment by individuals or associations has proved to be advantageous and profitable.

I spoke of scientific research. I have no disposition at this last stage to exhaust your kind patience with a disquisition on scientific farming. But let me say, that we lookers-on cannot understand this prejudice which exists among farmers against the application of science to agriculture. Why, what is agriculture but a science, both a science and an art, whose birth was coeval with the birth of man, whose growth has been measured by the progress of civilization, and whose perfection will not be attained till the race shall have reached its millennial state. Every manufactory has its chemist; every art and trade modifies and adapts its operations to come within the sphere of

new discoveries and fresh developments. If a shipwright builds a vessel, if a carpenter frames a house, if a miner embowels the earth, if a tanner turns skins into leather, if a machinist makes a steam-engine, if a cunning workman fabricates and puts together a watch, if an optician constructs a telescope, the last disclosure of science guides his hand and moulds his work; and why should not the farmer bring, to alleviate his hard toil, and make more exuberant the fruits of his labor, whatever aid science as well as art can furnish? There is a wide distinction between fancy and scientific farming. A man comes into the country from city or college, and sets out to be a model agriculturist. He buys a place, pulls down all the old structures and builds a small palace. He erects a green-house, and hennery, and piggery, and buildings for his cattle, which surpass in their appointments the habitations of decent people around him. He imports at fabulous prices foreign stock which he knows not how to use or raise. He buys whatever in the way of implements or tools is advertised as new, without knowing whether they are good or bad. And then he gets his books, and without previous experience, and spurning the advice of old cultivators, he sets up for a gentleman farmer. For a year or two he runs on swimmingly, makes a great figure, throws into the shade his humble competitors, and then, as might have been expected, he miserably fails, and a sheriff's auction closes the scene. And his neighbors cry out, "So much for your *scientific* farming!" It is no such thing. It is *fancy* farming.

Now look upon another picture. A gentleman (he may or may not have had early practical acquaintance with farming, but he has good sense and sound judgment) with resolute mind and purpose, and in gratification of long cherished wishes, devotes his attention and wealth to agriculture. He proceeds carefully and systematically. He has taste, and he makes his place an object of beauty as well as utility. His buildings are ornamental as well as useful. His fences are both handsome and durable. His fields are clean as well as fruitful. If there is an unsightly bog, he reclaims it and makes it fertile. If there are impoverished acres, he studies and experiments, and finds what elements are lacking, and supplies them. If, upon trial, he ascertains that his lands will not profitably raise cer-

tain accustomed crops, he rotates, and finds those which will yield remuneratively. His tools and implements are the best, and therefore the most economical. If the stock upon the farm is poor, he learns by inquiry and research what breeds are most prolific and hardy, best fitted for labor and for market. He eagerly avails himself of the practical experience of those around him, but at the same time he studies books and seeks the aid of science. From geology he learns the origin, nature and composition of soils,—from chemistry to analyze and improve them, the condition requisite for the most perfect growth and maturity of vegetation, and the mode of preparing the best fertilizers,—from botany the structure and habits of plants, and what soils and modes of treatment they demand,—from zoölogy those laws by which the re-production of animals is regulated and their highest perfection attained, and so, from all the natural sciences he gathers knowledge and applies it in his daily tasks, till complete success crowns his efforts, till the former waste becomes a garden, until what was once a wilderness is made to bud and blossom like the rose. This is the *scientific farmer.*

We have such in this county. We have them in this town. They are efficient officers and members of this society. They have striven hard to promote its welfare and extend its usefulness. They are in our midst here to-day—men whose talents, and wealth, and social position might give them public eminence and honor, but who, as exemplars of progressive agriculture, are doing more good than though they were conspicuous in public councils, or were ruling the storm of debate in legislative halls. Let the young farmer emulate such examples. Let him understand that to keep up with the times, he must read and study; that to become entirely successful, he must add to industry and economy and toil, science and skill. In no other way can he excel, in no other way can he improve his art and benefit his fellows. Our soil is not only comparatively poor, it is impoverished and worn out. Science and skill, and they alone, can restore its exhausted powers, and they can. They can make it as productive as western prairies or southern valleys. There is no reason why the agriculture of New England should not rival that of Old England. There is no reason why Massachusetts should not feed her whole

population. To make her truly independent she should do so. The responsibility rests upon the rising generation of farmers. Let us hope that they will cheerfully assume and nobly discharge it.

A few words, and but a few, upon one other topic, and I have done. You may call it, if you please, æsthetics, poetry, sentiment, by what name you will, but it is a subject upon which, if I had felt at liberty to follow my own inclinations, I should have filled my whole discourse. The young farmer will mistake his mission who makes that an end which should be but an incident or means. He may grow rich, may add barn to barn, and acre to acre, but if he neglects to wreathe the brow and soften the hands of labor with refinement and grace, his whole life will be a failure and his example a wrong. Farming must be made attractive; and though its profitable exercise will tend to this, yet if, through the want of other attractions, it does not gain the right class of recruits, it will soon cease to yield profit. Is not our farm-life too rugged and harsh? Has it sufficiently recognized the amenities of life? Has it adequately encouraged social culture and delights? Has it not deemed exclusive devotion to labor as indispensable to success, frowned upon whatever interfered with unremitting toil, and grudged the expended mite which would have added to its hoards? Has it not looked upon the exercise of taste, the gratification of the eye, the love of ornament and beauty, as something foreign and out of place, and recognized nothing as desirable or useful which would not pay in dollars and cents? Such, at all events, has been the prevailing tendency, and in it is to be found the great secret of that aversion to farm-life which "has taken directly from our farming population its best elements—its quickest intelligence, its most stirring enterprise, its noblest and most ambitious natures."

Let the young farmer, then, begin life aright. Remembering the well established fact of physiology, "that hard labor, followed from day to day and year to year, absorbing every thought and every energy, has the direct tendency to depress the intellect, blunt the sensibilities, and animalize the man," let him be sure to cultivate the mental, moral and social nature. Let him feel that "his farm has higher uses for him than those of feeding his person or his purse." As he looks

out upon his green meadows and waving fields,—as he plants the brown seed and gathers in the golden harvest,—as he listens to the song of birds, the lowing of herds, the sweet hum of animated nature,—as he sees the morning sun rise to gild and gladden the earth, and the evening shadows falling longer from the hills,

> "And then the moon, like to a silver bow
> New-bent in heaven,"

and the

> "Earth-treading stars, that make dark heaven light,"

coming out to rule and glorify the night,—as in the spring-time he watches the ever-recurring but ever great mystery of nature, and when the winds of autumn wail in mournful cadence, muses upon the decay of nature, less mysterious but more solemn than its bursting life, let him remember that he is one of God's creatures, but created for glory and honor, entrusted with an earthly mission, but required hereafter to render an account of his stewardship. Let him think of his family and his home—of his wife and children; she, the choice of his youth, and the solace of his manhood, who, in travail and pain has borne *them* to him, and *they*, who are to cheer and support his old age, and transmit and bring honor to his name. Let him make his and their home pleasant and cheerful. *Without*, let it be grateful to the sight, and delightful to the memory. Let there be the smooth, green sward upon which the shadows come and go, the clean-swept walk, the neat, white paling, the blooming and fragrant flowers, the climbing vine upon the rustic porch, the graceful trees which shade from sun and shelter from the storm. *Within*, let it be the abode of domestic joys and cultivated life. Let it have some sacred retreat, where labor shall forget its irksome tasks; where tired nature shall find sweet repose; where every thing shall charm the ear, delight the eye, or gratify the mind; where shall be comfort, propriety and refinement, not needing luxury or wealth, but only "that unbought grace" which neither gold can buy nor station give, and which may breathe alike around the rich man's stately mansion and the poor man's humble cottage.

Living thus, with trust in Heaven, with nurturing care for the dear ones upon the earth, seeing God in nature, and recognizing labor and its rewards as but the means and not the end, the farmer will lead another and a higher life. Existence will have a new meaning. There will be for him new heavens and a new earth. Drought and mildew, the blight may come, but hope and happiness are left. He walks through life, it may be amid storms, beneath clouds, surrounded by misfortunes, beset by carking cares, yet seeing forms of light in the gathering darkness, and drawing joy from out the very gloom.

> "The meanest floweret of the vale,
> The simplest note that swells the gale,
> The common air, the sun, the skies,
> To him are opening Paradise."

INFLUENCE OF AGRICULTURE—TENURE OF LANDS.

From an Address before the Middlesex Agricultural Society.

BY EMORY WASHBURN.

I mean to speak of the influence of agriculture as an employment upon a community, and how far this is affected by the nature and extent of the ownership of the soil in individual proprietorships.

Of the classes into which communities are, ordinarily, divided, the owners of the lands are, uniformly, the most fixed in their condition, and stable in their opinions. While, from long continued habits of association, men thus situated are apt to acquire peculiarities which distinguish them as a class from those engaged in other species of employment. They often derive habits of thought and traits of manner from mere dwelling together in particular localities, which a practiced eye may readily detect. This grows out of the influence which men exert upon others, by force of example, often in spite of themselves, by the mere intercourse of ordinary life. And the nearer and more intimate this association may be, the more marked and direct the influence becomes. While, therefore, a business like that of agriculture which extends to every part of a country is felt upon the moral as well as the physical condition of a whole community, it is itself modified by local causes by which the habits of life on the prevailing opinions of particular sections and districts assume characteristics and distinctive forms.

We may not be able to give a philosophical reason for the connection there is between the external circumstances by which a man is surrounded, and the qualities which go to make up the traits of his character; nor may we detect the subtle agencies by which a farmer in one locality is a different man from what he would have been in another. But who can doubt

the fact? If, for instance, we could take two children of equal natural capacities and place them upon different estates even in the same neighborhood, the one to grow up upon a hard, cold and exhausted farm, where every thing is managed stingily and without regard to comfort; the other to be reared upon a generous soil, with pleasant surroundings of scenery and taste and culture, who can doubt that those two children would grow up into men almost as different as the estates upon which they have learned their business of farming.

I make these familiar illustrations and common place remarks because of their application to men in the broader relations of states and communities. The character and condition of the fixed and stable portions of a population is felt upon every part of it. And it is for this reason that whatever affects agriculture as a pursuit, and tends to fix upon the men employed in it any peculiarity of character, stamps its impress upon the institutions of the State itself. The farmer in that way becomes the type and representative of the community in which he lives. The importance of this truth will at once present itself when it is remembered that while in our own country the men engaged in this pursuit outnumber those of any other class in every State, in some of the States they considerably exceed the aggregate of all other occupations.

If the men who till the soil are intelligent, frugal and industrious, and especially if the acres which they till they may call their own, it can hardly fail to give a tone of freedom to thought and an independence to spirit which we should look for in vain in a nation of tenants who hold their lands at the beck of a few old and lordly proprietors. Every school boy knows that the age of true Roman virtue and valor was when Cincinnatus was found at his plough, where he was named dictator, and returned again to the cultivation of his little farm, by his own hand, the moment he had at the head of his legions achieved a triumph over the public enemy. He knows too that, though mistress of the world, the empire had imbibed the fatal elements of weakness and dissolution in that policy which, among other evils, secured to the Patrician families large domains out of conquered provinces to be cultivated and carried on by the labor of slaves.

The history of modern nations, too, is full of illustrations of this connection between the condition of a people and the tenure of their lands, and the character of the labor by which they are carried on. We could in no way so readily measure the extent of the changes which were wrought in the social fabric of France by her Revolution of 1793, as by tracing the condition of her peasantry before that event and the extent to which it was affected by the monopoly of her soil into a few hands. Feudalism had kept its hold upon the lands of the kingdom up to the very hour when the yells of the mob rung through the gorgeous salons of the Palace of Versailles. And it was only by the common crash of the throne and the monopoly of the nobles, that the people began to share a heritage which till then had been denied them. The change upon the face of the earth which was witnessed when the deluge had subsided, could have been scarcely less marked than was that which the storm of the revolution left in the social condition of the cultivators of the soil of that kingdom. Two-thirds of her population, we are told, are now engaged in agriculture, and more than half of her entire people are proprietors of the soil.

It is not necessary to assume that because she has thrown open her lands to her people that she has done all that she ought for labor or for freedom. But we cannot fail to perceive that, in doing this, an element of strength and stability for her government has been provided which we seek for in vain among the nations of the South of Europe where the *Metayer* system or the working of lands by tenants upon shares, has so long prevailed.

In preparing our minds to judge of the importance of the principle I am attempting to enforce, I ought not to forget the condition of that people from whom we borrow so much of our history, as well as so many of the opinions which are current here.

The love of dominion over some portion of soil which he may call his own, is an instinct in every Englishman's composition. And whoever is favored enough to attain to this, is an object of regard to all who cannot aspire to so enviable a distinction. From the dependence of the manufacturing classes upon the agricultural, to supply their articles of consumption, this instinct for the ownership of land has been stimulated and strengthened

by the consideration that it is also a means of profitable investment of capital. And at this day the lands of the kingdom are divided into estates which have been growing fewer in number and consequently larger in size, till some seventy-five thousand persons, we are told, now own the entire landed interest of the kingdom. This necessarily leads to three great divisions of society which are arbitrary in many respects,—the nobles, the gentry and the commonalty. In the first of these are the princely landlords who do no labor. The second may possibly embrace a few of the farmers, so called, who hire the lands and employ others to do the principal part of the work, while the field laborer never rises above the lowest of these classes, and the idea, in his mind, of owning one of the acres which he is employed to hedge or plough, would seem as strange and preposterous as the hope of marrying a scion of the royal family, or being buried in St. Paul's or Westminster Abbey.

The influence of this inequality in the condition of those who do and those who do not own lands, and of those who do and those who do not labor, prevails and affects every class of employment in the kingdom. While only twenty-eight per cent. of the people of Great Britain are connected immediately, with its agriculture, the remaining seventy-two per cent. are guided, in no small degree, by the opinions and will of those who head this agricultural minority. It is not necessary that they should be out-voted by them, or that in physical strength, seven men from the shop should be over-matched by two farm laborers. But the possession of landed estates has become associated with ancient and noble families, and though, here and there, eminent talents, distinguished enterprise and skill may amass large fortunes, and thus enable their possessors to make themselves masters of greater or less quantities of land, such men are rarely found content to enjoy the mere luxuries and influence which wealth can purchase. There is a charmed circle above them, and they are hoping, some day, to reach this when their rent rolls shall have grown large enough, so that, instead of the ownership of land by a commoner being a means of weakening the power or influence of the class who are born to a titled name, it becomes one great means by which this power is perpetuated. While the farms of England and Wales average, we are told, only about sixty-four acres, the Duke of Devonshire

owns ninety-six thousand acres in a single county in England, and the income of the Marquis of Westminster is a million or more of dollars a year.

The influence of this tremendous inequality in rank and condition, as connected with the ownership of the lands of the kingdom, cannot fail to impress itself upon the whole social condition of England,—class and rank pervade every thing. And there is nothing which strikes a stranger more sensibly, while studying the habits of the English people, than the subserviency to superiority in blood or rank, which runs through the whole nation, from the first Duke of the realm down to the humblest cabman in the street. The lordly land owner, whether titled or not, looks down with condescension upon the farmer who hires his land. And he, in turn, looks down upon the hedger or ditcher or ploughman who does the work upon it, and rare, indeed, is the instance of one, brought up under such institutions, attempting to call their wisdom or their humanity into question. Indeed, the law has, for hundreds of years, lent its strong aid in perpetuating these ideas by the rights of primogeniture which it secures, and the practical system of entailment which it favors.

These notions, we are to remember, took root and grew up before these modern days of the loom and the spinning jenny. Whether they could have ever obtained against an antagonism like that of a community of artisans and manufacturers, I have no occasion now to discuss. John Bull was born and had grown up to manhood, with all his domineering ways and habits of assurance, long before Arkwright was heard of, or Crompton had conceived of his mule, or Watt of the steam-engine. We are to look for the origin of his uncomfortable manners and habits away back in his history, when the baron lived at home in the country surrounded by his vassals, and never thought it necessary to spend three-quarters of the year in the din and smoke of London, to help give a tone to the omnipotence of public opinion.

The tendency of throwing into the hands of any one proprietor large quantities of land, over which he is master, but upon which he is not obliged to labor, in exciting and strengthening a proud and haughty spirit incompatible with any thing like practical equality in the classes or employments into which communities are divided, may be traced in the history and condition

of every people where it has prevailed. But I need not have gone beyond our own country to find illustrations of this as a moral and political axiom. As an offshoot from the mother country, the people at the North, at least, brought with them English notions as they did their language, and planted them here to grow up with the colonies. In one respect, however, there was an important difference between the people of New and Old England. While the colonists clung, as for their lives, to the Magna Charta and the great elements of personal freedom and security which were found in the British constitution, while they cherished with fondness and pride the memories and historic associations which clustered around the old homestead, they had come, themselves, from the intelligent middle classes, and had not been accustomed to share in the ownership of large estates in lands, and were content, under the democratic training to which their religious notions and educations had led, with such portions of the new territory of which they found themselves the masters, as they could personally cultivate and manage. In other words, without perhaps knowing the name which could best describe their social condition as colonists, they constituted as pure a democracy as can well consist with wise laws, public quiet and individual security. This, too, was substantially the condition of the Southern colonies, with such differences as grew out of their ideas of church polity, and the forms of their governments prescribed in their respective colonial charters, as well as the nature of their associations before leaving the mother country. This state things continued until the Revolution; although as showing the radical difference which had even then grown up between the two sections in matters of opinion, it is said that during the Revolution there were hardly patriots enough among the people of the South to keep the loyalists in check who still clung to their fealty to the crown.

The leading spirits, however, both South and North, not only went hand in hand through that struggle, but in the no less important crisis which gave the country peace, prosperity and power, by the adoption of the Federal Constitution. It was the result of a generous sacrifice of local prejudices on all sides, and a compromise of conflicting interests and opinions, and it found no abler or more devoted advocates than men bred under and

interested in the institutions and habits of the South. And we may add, that so long as that generation bore an active part in the affairs of our government, its compromises were maintained, and the different sections of the Union were at peace with each other. It was not till the Union, by the incentives it offered to enterprise, and the security it furnished for all who had gathered within its fold, had begun to develop the almost boundless resources of wealth and moral and physical power which a virgin soil, a favorable climate, a region unrivalled for its advantages to commerce and the arts, and a free government could not fail to bring into active energy, that men were found ready to discard the principles upon which the constitution was framed, and to sacrifice the prosperity of this great nation for some fancied advantage to a section of her territory.

We hear the question asked every day, what has wrought this change? Why do we see a whole section arrayed in arms to overthrow by brute force, the very government that gave them life, and has given them the capacity of making their hostility to its integrity formidable? Why are all the ancient feelings of sympathy and kindness towards brothers of a common blood, with a common history and what had seemed to be a common destiny, now changed to bitterness and hate? Slavery, of which we have heard so much, is not a new institution, nor are its merits a new subject of discussion, or a new element of discord. These discussions and these feelings have, doubtless, become greatly intensified since the constitution was adopted. But no one, I imagine, would think of ascribing this disastrous revolution of sectional feeling to this as the only exciting cause. The whole number of slave owners in the country is said not to exceed some three hundred thousand, and it is difficult to suppose that twelve millions of people would be ready to rush into a civil war simply to avenge the hard names which writers and orators at the North have, of late, applied somewhat liberally to the institution of involuntary labor.

Nor, powerful as may be the influence of noisy demagogues in a community, with few schools and a limited supply of newspapers, have we a right to suppose that mere words, however angry, could have exasperated reasonable men to deeds of such folly and wickedness, or combine them in the work of tearing

down, with a ruthless hand, the pillars of the constitution on which their own safety and prosperity must rest.

No adequate cause for this state of feeling is offered in any of the proclamations or manifestos which the leaders of the conspiracy to overthrow the government have put forth to the world. They specify no act of national legislation which violates any of the compacts of the constitution. Indeed the policy, and, for the most part, the administration of the federal government has been in the hands of the very conspirators themselves, or of those whom they affect to represent.

Something deeper than all this has been at work in throwing the delicate machinery of our national system out of gear. It is not the work of a day or of a year. It has been operating for more than a generation, and the men are in their graves who first detected and sought to avail themselves of the elements of discord which had grown to be palpable to the careful observer.

If we can get at the true cause of this lamentable revolution in local policy, my belief is that it will be found that the outside agencies of lust for office, bitter invective and political rancor, are but the stimulants that have brought into action seeds of disorganization which are more deeply planted in the body politic.

I do not overlook the mighty power of the press, nor the influence of party organization for political action. Nor am I unmindful of the control which the population and business and capital of our cities and our towns, or of those engaged in manufactures and mechanical industry, are always sure to exert in any community where they are found. But most of these agencies are comparatively feeble at the South, when measured by their power at the North, and, as it seems to me, go but a little way to account for the present radical difference there is between these two sections, when compared with the influence which the agricultural condition and pursuits exert upon the thoughts, the feelings and the habits of the people.

It is not necessary that the agriculturists of the two sections should originally have cultivated hostile feelings towards each other, or even be conscious that they were in a condition of antagonism to each other. If the system of policy pursued by one section or the other, as to the mode of cultivating their lands, the kind of operatives they employ or the social position

the land holders enjoy in respect to rank as a class, or even as to the character of the crops they raise, leads them to call for different laws, or clothes them with different responsibilities and powers, and holds out different motives to effort, it is not difficult to see that, in spite of any preconceived wishes on their part, not only might the agriculturists of different sections, thus divided, become alienated from each other, but it could hardly fail to involve other interests in a similar antagonism of feeling. If for instance any thing like a spirit of democracy could grow up in one section, while that of aristocracy prevailed in another, who does not see how easy it might be for a set of selfish politicians to turn these sources of alienation to their own account, and to fan this feeling into one of passion and hate?

Now let us look for a moment, at the condition of these two sections in the broad daylight of their agricultural interest and economy, the division and ownership of their lands, the labor by which they are cultivated and the relative rank they hold in the scale of occupations and employments into which the community around them is divided.

Looking first at what so many regard the chief cause of the discord which prevails,—the question of labor,—we shall find that the irreconcilable conflict between voluntary and involuntary service has been gaining strength and consistency with every step which the South has been taking in enlarging the extent of individual proprietorship of lands.

Up to 1780, we had slaves all over New England as well as the other colonies. But the farms here were small, and their owners were neither able nor disposed to employ many of this class upon their estates, or to shrink, themselves from labor. The genius of our institutions was always hostile to slavery as an institution, and a law, passed as early as 1641, had it been applied, would have exempted every native born child from the condition of a slave. The consequence was that, so far as it existed at all, it was strictly a domestic institution, where the master and the slave wrought in the same field, eat at the same table and went together to the same church.

This state of things, moreover, stamped a character upon New England institutions, for agriculture was its great and leading interest for near two hundred years. Navigation and the fisheries gave lucrative employment to great numbers of

her sons, but as for mechanics, there were scarce any besides what were necessary to meet the more pressing domestic wants of the people, and hundreds are now alive who saw the first thread of cotton spun by machinery in a neighboring State, while the grave has just closed over that sagacious and excellent public spirited citizen whose far seeing policy conceived and whose energy helped carry out the works at Waltham and Lowell, and laid the foundation for that system to which Massachusetts owes so much of her wealth and prosperity.

This condition of agriculture, so suited to the tastes, habits, and resources of the early settlers here, was perpetuated by laws distributing the property of the parent equally among his children, and providing for the free education of every one by means of the common school. The consequence was that every man felt that he was as good as his neighbor, and looked forward to earning his own way to independence by his own industry. Such a thing as a "poor white man," in the sense in which that term is applied at the South, was, I apprehend, scarcely to be found in all New England. Another consequence was that, the moment these colonies were free of the mother country, slavery disappeared from New England, and here labor upon the farm and in the workshop has ever since been free.

Agriculture here has neither asked nor received special favor or special legislation at the hands of the government. It has maintained a policy which forbids any one class from monpolizing power or influence. And in the formation of their own constitutions as well as the part they took in that of the federal government, the people were disposed to delegate no more of the sovereignty of the whole to its functionaries than was necessary to organize the dwellers in the different States into a mutual association for the common good of the whole—not as a compact of towns or counties or states, even, but as "We the People of the United States."

The social policy of New England, fostering free labor, excluding the idea of large monopolies of land, to be cultivated by tenants or degraded operatives, giving to the farmer a social rank and position on an equality with other branches of honorable industry, has been carried, with her sons, to their new homes at the West, and has spread till the condition of agriculture which prevailed among the planters of New England has

become identified with the prosperity of every Free State in the Union.

If now we turn to the Plantation States, as they are called, what do we find the condition of things to be in all those respects to which I have confined myself in speaking of the North?

At first, at least, they were content with the Union and the Constitution. We are told from high authority that they then contemplated the time as not far distant when slavery would give place to voluntary, free labor. The staples of the two regions were, in some respects, different, depending upon climate and soil, but it occasioned no jealousy between them, and the agricultural economy of each, especially so far as any great and general monopoly of lands by a few producers was concerned, was substantially the same. The passion for large proprietorships which has lately manifested itself so strongly, may be traced, it is believed, to the introduction of the cotton culture near the close of the last century. It became an object, at once, with the cotton planter to buy more slaves and to extend his plantation. The number of his hands and of his acres necessarily bore certain proportions to each other, and the wealth and influence of the planter began to be measured and graduated by the slaves he worked and the number of bales he gathered from his cotton fields. As the old fields wore out, new ones must be acquired, till an eagerness for new territory began to infuse itself into the policy of the government itself, and to bring with it mischiefs which the constitution never contemplated.

But what bears more immediately upon our subject, this concentration of the wealth of districts into a few hands, in the form of landed estates, requiring to be worked by slave labor, led almost necessarily to a division of its population into three classes—the planter, the slave, and that other class containing the nondescript species of humanity called the "poor white man," which I place last as being the least fortunate of either in the scale of social comfort or independence. Labor, of course, is degraded to the standard of those by whom it is performed, and in a community where one great leading staple of agricultural produce engrosses the attention as well as the fixed capital of every man of enterprise, few interests like those of

manufactures or mechanical employments find countenance or encouragement. Every business is consequently in a great degree dependent upon the one great interest of cotton planting, and he who holds the land, commands the labor and sends forward the crop, becomes, as a matter of course, one of the leading spirits of the district, and is in a condition to control the opinions, interests and wills of others.

Now when we remember that there are probably not more than about two hundred thousand slave-owning planters, and that these collectively own nearly two hundred millions of acres of land, we see at once that they are in a situation to become, almost as a matter of course, practically a landed oligarchy, and as such, to exercise a control over all other interests and pursuits. Such a state of society begets that desire of power, that love of dominion, and that restlessness under the restraints of the law which has characterized every oligarchy in a state of which we have any account in history. In France it made the ancient regime before the revolution. In England it sustains her aristocracy, and makes the commonalty themselves the prop and support of that institution. And in this, as it seems to me, we find a much more potent cause for her sympathy with the South than in any eagerness she may manifest to reach the cotton of the Southern planter. The main difference, however, and it is a lamentable one, between the oligarchy of a body of planters and slaveholders, and the aristocracy of England is, that while the one has become dignified by education and habits, by old names and historic associations, the other rests on none of these, but upon the mere institution of large plantations and labor wrung from a poor, down-trodden, dependent race of beings. While the monarchies of the old world have built up their favored class upon birth and family and the possession of ancestral acres and renowned names, the men who are now seeking to break down the democratic institutions of our free, national government, are striving to build up a system of polity and social organization upon what Mr. Vice-President Stephens, as they are pleased to call him, has told the world was the corner-stone which all builders before them had refused, and that is negro slavery.

AGRICULTURE AND WAR.

From an Address before the Housatonic Agricultural Society, Sept. 26, 1861.

BY GEORGE B. LORING.

We are to-day upon the height which marks the rise and fall of the farmer's season. Behind us is the morning of the year, the glowing and luxuriant summer, with its promises and its growth, sweet and beautiful with blossoms, constant in its labors through the long days and the short and feverish nights, radiant with the heated and molten air, hung with the heavy drapery of massive clouds, filled with the ardor and exuberance of youthful life. Before us lie the lengthening shadows of the declining day, of autumn with its weight of ripening harvests, with its landscape on which the repose of maturity has settled down, overhung with bluer and cooler skies, enveloped with a misty stillness, which tells of bounteousness and plenty. And, as we survey our fields of toil on either hand, how should our hearts swell once more with gratitude, and our hope revive, in the presence of those blessings which the heavens above and the earth beneath are constantly bestowing upon the faithful and devoted husbandman.

This is indeed a year of plenty. The earth has dispensed her stores with large and liberal hand. Our skies have been serene; the soft falling dew, and the "diffusive rain," have cheered the growing leaf and blade; all nature has worn a smiling face; and her full lap now offers its abundance, like a kind and gentle mother, to cheer the hearts of all her sons.

If genial seasons, and fertile fields, and groaning harvests, can make a people happy, our cup would indeed be full. But it is not. I see everywhere a shadow. The bedimmed and brazen sunlight tells that the great orb is partially eclipsed. The burden of a great calamity has left its mark upon us; the public joy written on our faces, cannot conceal the traces of

that sorrow which will now and then overcome us, in spite of our confidence, and our resolution, and our trust. The silent spindle tells a tale of sorrow which the passing husbandman must hear. The deserted wayside shop will be heard, as it recounts the warlike deeds of those who but just now crowded, a busy throng, within its happy walls. The weary traveller has his tale of want. Upon the lonely wharves as on a dial-plate, the motionless mast counts off the morning and evening hours of its long days of idleness. The Flag of our Fathers, flying from every hill-top and spire and gable, manifests continually, as an oft-repeated emblem, the great trial before which an industrious and patriotic people has paused in its pursuits. As we labor in our fields, the national distress goes with us. For who can forget the heroism of those who left their ploughs in the furrow, to go forth and fight the battles of freedom? Who can forget the greatness and devotion of those who established this civil fabric, which was their pride, and has been so long our own? Who can forget the glory of our nationality? Who can forget the ascending prayers that went to heaven at our nation's birth, and are now renewed in the agony of an hour which beclouds the sky lit up by Washington, and in which the veil of our temple seems to be rent in twain? Oh! my friends, the earth may smile, and the sun may shine, the flowers may bloom, and golden seas of harvests wave, but we cannot forget that we have a country in mortal throes, nor can we, if we would, lose sight of the duties which press solemnly upon us, as citizens engaged in the great business which alone can sustain men in the trials of war. While other pursuits pause before the storm, to us belong the sword as well as the ploughshare, the spear as well as the pruning-hook, the support of our country in contest, its right arm in war, its substantial wealth in times of peace.

I would not overestimate the position of agriculture, among all the arts of life, in a crisis like that which is now upon us. I do not overestimate it. In peace it founds nations, in war supports them. "Romulus founded his state on agriculture and war," says a distinguished German historian; and centuries of national grandeur bear witness to the power of the combination, for the purposes of growth and aggression. Egypt, cliff-bounded on either hand, has cherished that precious soil which

tempted the first Ethiopian to descend the Nile, until ages proclaim the peaceful triumphs of agriculture there. India too grew rich through all trials, because it constantly received the tribute of three parts of the world, for its native productions, —the gold of high Asia and Ethiopia, Spanish silver, Arabian incense, and Phœnician merchandise. China, unchanging as she is, has been able to maintain her armies for defence and in civil conflict, within her own territory, because she could always feed and clothe them. On the other hand, Carthage, devoted to commerce and war, without large internal resources, powerful only as stronger than any of her well-watched colonies from which she extorted heavy tribute for her own support, fell to rise no more. In the earlier ages, as now, the people who had the largest lands, and the most cultivators of the soil, carried on the most successful wars; and then as now commerce and manufactures, from dangers and poverty, usually suffered most severely from the blow.

The experience of modern Europe also proves this to be true. At the conclusion of the peace of Aix la Chapelle, almost all the nations of Europe, by a sort of tacit consent applied themselves to the study of agriculture. The French found by repeated experience that they could not maintain a long war, nor procure a tolerable peace, unless they raised corn enough to support themselves in such a manner as that they should not be obliged to submit to harsh terms on the one hand, or perish by famine, on the other. Even during the distresses of the great revolution, the rulers paid some attention to agriculture, an attention which was increased during the days of the Consulate and the Empire. Various schools were established. The convulsive shock of the revolution which had overthrown many useful establishments, and retarded the advancement of many improvements, did not prevent the progress of this essential art. On the contrary, agricultural societies increased, and agricultural writers increased in a very large proportion. It is her lands, not her mills, nor her ships, which has enabled France to carry on her exhausting foreign and domestic wars.

If we turn to England, we may learn the same lesson of her. During the last two centuries her power and wealth have increased to an extent almost fabulous. During that time she has passed through one revolution, and many foreign contests. Her

taxation has been increased more than thirty-fold; and foremost among all those branches of business which constitute her public resources, stands agriculture. It is true that during the time referred to, Manchester and Leeds and Birmingham and Sheffield have risen from insignificant towns, to their present opulent condition as the head of the cotton and woollen and hardware manufactures of the world; and Liverpool, the commercial emporium, has increased her population from four thousand to three hundred thousand, and her tonnage from fourteen hundred tons, ("less than the tonnage of a single modern Indiaman,") to five hundred thousand tons. "England is unquestionably the greatest commercial and manufacturing power on the globe; her navies ride in every sea, and the evidences of her mechanical skill are scattered over every land; and yet it appears from the returns of her income tax, that the net revenue of all her manufactures and commerce, and of all her immense personal capital, does not exceed two-thirds of the net income from the agricultural productions of that small island," containing less than 123,000 square miles, and smaller than several of the largest States of our confederation. It is the agriculture of England which has more than all other pursuits kept pace with her advancement, and has furnished her an unfailing support in every crisis. In 1685, the arable and pasture land amounted to no more than the half of the kingdom. In the moors and forests and fens which occupied the remainder, the deer and wolf and fox and badger held undisputed sway, while the lakes and shores and marshes furnished homes for immense numbers of eagles, bustards and cranes. Since that time probably one-fourth part of England has been turned from a wild into a garden; the quantity of wheat, rye, barley, oats and beans annually grown has increased from ten millions of quarters to over thirty millions; the wheat crop alone has increased from sixteen millions of bushels to ninety millions; and the vast system of root culture, of which it has been said that "the power of the British Empire rests on her coal, her iron, and her turnips,"—as well as her great supplies of beef and mutton, can hardly be computed. With a population of nearly 28,000,000 and an army consisting of 150,000 men, England has never lost sight of that great industry, which has made her strong at home and abroad, and has,

amidst the reciprocal benefits which all human occupations bestow and enjoy, given by far the largest share. In the tenure of land, in the application of forces, in the use of manures, in the selection of crops, in the breeding of animals, England has exerted all her ingenuity and skill. It is because she feeds her people so extensively from her own soil, that she has strength to stretch forth her Briarean arms, in every contest, and to send her colonies to the farthest shores.

Turning now our eyes from the policy and experience of other lands and other times, to our own, we may learn our duty and interest as members of the agricultural community of the country. Within the boundaries of the United States, including every variety of soil, climate and production, nearly one-half the industrial product of the people arises from agriculture—amounting last year to about eighteen hundred millions of dollars. I look upon this as the foundation of our national strength; from it we are fed and clothed; it served to pay our debts abroad; it furnished raw material for our mills, the life-blood of our great towns—freight for our ships, our wealth in peace, and now our support in war, associated as it is with the thousands of manly forms and loyal hearts engaged in its production.

How fortunate for us that this is so! The possession of this wide-spread capital, this substantial wealth, invigorating so great a people, and occupying so large a territory—how great its present strength—how large its future possibilities! Who may not see in it the progressive capacity of a great nation? Is it not our safest capital? As I see the lofty walls of your manufactories rise in massive grandeur, at the command of energy and ingenuity, and am told that capital estimated by millions is employed in their many channels, is it not one more effort to add value to the products of agriculture? Is it not wool or cotton or flax that has ordered this busy palace into existence? Is that mill any thing more than one of the implements which bring the produce of the soil into actual service and gives it a real value? What the plough and hoe began, this marvellous intricacy of machinery has finished. The field furnished the capital—the mill made it active. So too the sea is stayed by stony buttresses, and wharves stretch out their arms, and the great docks offer their shelter as cradles for our

ships, and white sails waft the precious argosy into the quiet haven—all implements which commerce uses to give value to the crops of the world—tea from China, spices from the east, fruits from the Mediterranean, hemp from Russia, grain from the Baltic, sugar and coffee and cotton, the staples of trade, from every tropical luxuriance.

Some one has said "land alone is the true source of wealth, because it produces every thing that man desires for the supply of his wants, for his enjoyments, his pleasures, and his fancies; and because it constantly reproduces a quantity superior to what has been consumed to effect its reproduction. This excess of reproduction, this gratuitous gift of the soil, this net produce is the only fund that can be employed to encourage the progress of labor, to reward its success, promote improvements, and indefinitely to increase the sum of public and private wealth." If this be true, from the rich valleys of eastern rivers to the praries of the west, what an abundance of riches do we possess!

This capital, I conceive, can be employed in two ways; one for the increase of the foreign trade of a country, the other for the supply of necessaries and the increase of domestic comforts, and luxuries. The former adds to the perishable wealth of a people, in proportion to the profits realized on the product raised; and it brings with it, in the same proportion, all those characteristics which usually attend rapid accumulations of wealth, and the sudden changes which go with them. It is estimated by those commercial and manufacturing enterprises which create large home markets, and from which good farming should radiate in every direction. The latter enriches and embellishes steadily and slowly. It requires small farms, good cultivation, industry, personal application. Its attendants are the New England farm-house, that home of frugality, prudence, simple habits, and quiet Christian virtues—that birthplace of so many of the best human faculties required by a busy world, and the New England church and school-house.

To those great agricultural sections of our country where the value of land is favorable to large possessions, and where the quality of the land invites to easy and somewhat indolent agriculture, we must look for a large part of that surplus production which enters into our domestic and foreign commerce,

and constitutes one of our national pillars. Not the valor of our people alone, not the military skill of our army alone, not our geographical position alone, has made us a formidable combatant;—but added to all these the existence of a great western granary, whence we could draw a constant subsistence. I have always admired that territorial advantage which we have possessed in the ownership of broad and fertile contiguous lands. It has enlarged the minds of our people, and dispelled those provincialisms, which incrust a community whose limits are circumscribed. The efflux of population from the narrow valleys and sharp hills of New England, into the broader and more luxuriant regions of the West, has sent back an undertow of larger liberality, and grander nationality, which has been a generous donation from the children to the parent. While New England has done much to people the West, the West has done much to enlarge the heart of New England. And as the child matures, I believe it will be found that no enervating influences can destroy that thrift and energy of character which it has received as its most valuable inheritance.

But more than this. What a stimulus have western crops given to eastern manufactures. Massachusetts has not for years produced one-half of the provisions she consumes. While her people have been busy in every branch of trade exploring all seas, directing the power of every water-fall, lining her highways with shops of the mechanic and artisan, she has been fed from regions where agriculture still holds sway supreme. So long as the production of corn and flour and beef and pork occupies the people of Ohio and Illinois, so long the busy crowds of Lowell and Lawrence and Worcester and Boston feel sure of a subsistence. A more fortunate order of Providence the world has never seen. Bound together as these two sections are by the ties of blood and interest, by common ancestry and by common and mutual industry, they possess at all times great elements of strength.

Now what is true of these two sections in peace, is true also of them in times of war. Their mutual relations are not changed. The prairies that have fed a manufacturing people, can feed a warring people. The vast harvests, of which hitherto so large a portion has been consumed at home, now offer their vital force to a nationality striving for its existence. Let no acre lie idle.

Let no man desert his land. Let there be, ever and aye, stores abounding, which an industrious and devoted people will never leave unfilled. From those far off, broad, and teeming plains, nature stretches forth her hands filled with abundance, the offering which she lays at the feet of a nation toiling for its existence. No princess ever laid such jewels on such an altar.

In a time like this, let not the farmer of Massachusetts lie idle. His sphere may be narrower than that of which I have just spoken, but it is none the less important. He may not forget the obligations which fall upon him, when labor is driven from other channels, and turns with longing eye and pallid cheek to the land for support. He cannot forget those whom husbands and fathers have left behind for kindly care, while they themselves have gone on a nation's errand, perhaps never to return. And, in the midst of all these complex duties, he should not forget that ardent appeal of the Chief Magistrate of this Commonwealth, to increase his crops, as he would serve his country and his generation.

Increase your crops. This is the first and great agricultural commandment. Massachusetts should have done this long ago. She should have done it when all other industrial pursuits, offered their aid to agriculture. She should have done it when her manufacturing cities and her mechanical villages presented their active markets. Let her do it now, in this hour of trial, when if she would do her whole duty, she would feed her own population. Let her do it now, that the day of peace may find her better prepared for all its blessings.

Massachusetts has never yet appreciated her agricultural opportunities or capacity. Her manufacturing enterprise, instead of absorbing all her energy, and taking labor away from the land, should have stimulated as with a fertilizer, every corner of her territory, into increased agricultural effort. That influence which has extended from the markets of Lowell into the fields lying in a narrow circumference around the city, should have reached into every pasture and cornfield on the hills of Berkshire, until as it were, the light from our mills had enlightened every farm in Massachusetts.

No State has enjoyed that diversity of labor which affords mutual benefit to all, to such an extent as has our own. Many

other States have sought for it in vain. It is a condition which our soundest statesmen have urged their people to secure. Said the Hon. Joel R. Poinsett to the citizens of his native State: "Both from observation and reflection, I am convinced that a State entirely destitute of manufactures, whatever may be the nature and extent of its staple productions, will always be inferior to one that combines manufactural industry with agricultural wealth. In the first place, materials to a very large amount, which might be worked up to advantage, but which will not bear the cost of distant transportation, are wasted for the want of neighboring manufactures. In the next, it is destitute of those towns and villages that grow up around such establishments, affording home markets for the produce of the farmer, more advantageous than those at a distance, and supplying him with necessary articles at a cheaper rate, the price being diminished to the amount of the cost of transportation. * * Where manufactures exist, the individuals interested in their success and prosperity, from their proximity to each other, easily unite their efforts for all purposes of common interest; and good roads, and canals result naturally from such combinations, and convenient lines of communication are everywhere established, so as to give to each one his fair share of the advantages of trade. * * In purely agricultural districts, the products of industry find their way to market by miserable roads and circuitous lines of communication, to the great loss and inconvenience of the former."

More than ten years ago, an intelligent citizen of South Carolina, by a statistical comparison of his own State with Rhode Island, showed the great advantages which the population of the latter enjoyed, on account of their combination of agriculture and manufactures. At that time a division of the annual gross income of Rhode Island among its inhabitants, gave to each one hundred dollars, while South Carolina divided only forty-five dollars. He attributed this condition of things to the fact that the labor in Rhode Island is diversified—in South Carolina it is not. And supposing both States to have enough of wheat, rye, oats, barley, potatoes and hay to support their population and cattle, and the one hundred thirty-eight thousand eight hundred and thirty inhabitants of Rhode Island will earn ten millions eight hundred one thousand nine hundred

and fourteen dollars, while the five hundred forty-nine thousand three hundred and ninety-eight inhabitants of South Carolina, will earn eleven millions seven hundred sixty-two thousand nine hundred and eighty-six dollars, or a surplus to each one of the former, after feeding himself, of ninety-nine dollars for clothing and other expenses, and to each one of the latter, less than twenty dollars. It should be remembered that at this time, South Carolina was deficient in a self-supply of grain as much as a million and a half bushels, while Rhode Island had a surplus of nearly that amount.

He does not forget, moreover, the great inland trade which manufactures create—an interest in prosperous countries always greater than foreign or direct trade—being, at that time, in England or New York, fifteen times greater.

Now, what this citizen of South Carolina desired for his State ten years ago, we in Massachusetts have possessed for the last quarter of a century. There is not a county in this Com monwealth, but possesses one or more large manufacturing or commercial towns. Hardly a township which has not one or more villages devoted to mechanical pursuits within its limits. Markets are open everywhere. Those means of communication which presented such attractions to the mind of the statesman whom I have just quoted, surpass among us even his anticipations. Railroads intersect our State in every direction. Almost every acre of land is brought within easy reach of a market; every crop is brought close to the door of the consumer, whether the commodity be rapidly perishable or not. Even our blackberry and "huckleberry" pastures have increased in value under the influence of these great highways, and shall not our cornfields and hayfields, our gardens and orchards, as the special objects of our care, keep pace with natural wilds and their spontaneous fruits?

The enterprise, and industry, and accumulating wealth of Massachusetts have been all absorbed in business connected with manufactures and commerce, until a mill and a ship are the emblems of our chiefest industry. We have made our markets but for others. *Sic vos non vobis.* Not for ourselves, not for our own fields, not for our own yeomanry, not for the enriching of our own lands, not for the consumption of our own crops, have we done all this. But we have commanded all these

hills and valleys to lie still and witness what we could do for the agriculture of others. We have withdrawn our forces from our own fields, in order to build up markets for others; and we seem to have forgotten that while we have enlarged their wealth, and given value to the productions of their soil, and furnished channels for their capital, we have neglected our own. And will you tell me where in this crisis the trial is the harder—in Iowa, where corn is worth but ten cents a bushel, or in Massachusetts, where the loom is silent, and the laborer is waiting for the dawn; in the West, where is the producer, or in the East, where is the consumer of the necessaries of life? If you ask me who can do the most towards paying the bills of a war, that is one question; if you ask who can best support its population during a long and harassing conflict, that is another and very different question. What I desire for Massachusetts is the power to do both, and to fulfil to the highest degree that duty which she has taken upon herself of being foremost in the defence of Federal authority, and the government of the fathers, and in which her sons have crowned her with new and more refulgent glory.

Increase then your crops. Do you ask what crops? I say every thing that grows well here for the sustenance of man and animal; for this is what we need most. Our climate and soil are peculiary adapted to grain, hay and pasturage. North of thirty-six degrees north latitude, these are the staples. And they lie at the foundation of all that constitutes the necessary food for man; offering every inducement to steady and devoted labor; and inasmuch as they have but little to do with foreign commerce, and the fluctuations that attend it, they offer none of the temptations to a restless and extravagant community, which attend the production and sale of raw materials for manufacture and luxuries.

We can raise corn here at a profit—not twenty-five or thirty bushels to the acre, but seventy-five or one hundred bushels—a crop attainable by every good farmer, and just as easily produced as a smaller one. It is a most valuable product, convertible as it is, into beef, pork, mutton, and bread, and furnishing almost every thing necessary for the support of animal life on the farm. As I pass along the road in almost every section of the State, I see everywhere neglected lands,

peculiarly adapted to this crop, and capable of rendering a reward to the cultivator as well as of pleasing the eye of the traveller.

Of the hay crop too much cannot be said. Nowhere, that I am aware of does the earth furnish such luxuriant grass, adapted to hay, and the heavens such a sun with which to dry it, as are found in the Northern States of this continent. Entering as it does very largely into our domestic trade, and supplying a want which in winter is imperative in our climate, it is really the staple of our home market. Grass will always pay for cultivation. When near the market it always finds a ready sale, and when remote, it is an economical and profitable food for all the domestic animals that enter largely into the economy of the farm, and constitute one great source of its income. Hay, although it does not enter into our foreign commerce, and cannot aid in preserving a balance of trade with any other country, may be made a mine of wealth to the farmer and his farm.

In all sections of the State where hay finds a ready market, and commands a high price, roots are a profitable crop. Indeed, a proper supply of roots will be advantageous to cattle-feeders everywhere. They extend the haymow and corn-bin far beyond the cost of cultivation; and require a careful system of husbandry, which may be of very essential service to all our farmers. Perhaps when hay is cheap, and corn can be consumed on the farm more profitably than carried to the market, root crops are unnecessary. But when their cultivation becomes a part of the system of every farm, the agriculture of Massachusetts will receive an impulse hitherto unknown. Better grass crops, more beef, more dairy products, more manure, more money follow in their train.

Be not induced to devote too much of your best lands to fruit trees. Fruit is an uncertain crop, requires a large outlay of time and money, and occupies land to the exclusion of constant cropping; and you have all seen the old orchard, which exhausted all its stores for the father who planted it, standing in the way of the sons, who cannot find it in their hearts to cut down the trees which were landmarks in their childhood. Plant a few trees; cultivate them well; with bones, and lime, and ashes, if you want fruit—with barnyard manure, if you want leaves, and roots, and branches.

These, with garden products and small grain, are the crops best adapted to Massachusetts, and promise the surest returns to the farmer. They will feed our people, and multiply the peaceful and happy houses in our Commonwealth.

In addition to these, we have been urged to enter largely upon the cultivation of flax, as a textile fibre, capable of making us independent of all the similar productions of our neighbors. It is possible that it might increase the wealth of the farming community. But we should remember that until we raise food enough for home consumption, we can hardly expect to compete with the great regions of the earth in which textile crops grow almost spontaneously. I doubt whether we could compete with cotton growers; and although we are quite indignant with cotton just now, still I believe some measures more strenuous and efficient than raising flax in Massachusetts, will be required to remove the difficulties which attend it; and I believe, moreover, that it is cheaper, and more manly, and more patriotic to fight for our cotton until we get it, than it is to undertake to supersede its use by the cultivation of a plant which has been rejected by every high system of agriculture, and is confined chiefly to regions where the soil is poor and the people are poorer. It requires nearly all our agricultural labor in the Northern States to feed our mouths; as in 1855, we exported only eight million bushels of corn out of nearly eight hundred million bushels raised, and the same proportion of wheat, and all our other agricultural products. We are asked to add to these Northern products flax enough to take the place of one million bales or five hundred million pounds of cotton, our annual consumption. We cultivate now thirty-one million acres of corn, and eleven million acres of wheat; and if we would raise flax enough to accomplish what its advocates promise, we must add one million acres to those already under cultivation, allowing each acre to yield five hundred pounds. Flax is a troublesome and exhausting crop. England imports all she uses from Russia, and in spite of repeated premiums, has failed to introduce it into her own kingdom, because corn pays a larger profit. It has never been a profitable crop in this country.

To bring it into competition with cotton would be a somewhat difficult matter. Let us consider a few facts. The

cotton crop of 1859 was four million eight hundred and fifty thousand bales, worth two hundred forty-two millions five hundred thousand dollars. The cotton consumed in England in 1860 was two millions four hundred thousand bales; in the United States one million bales. It has thus far superseded all textile fibre by its cheapness, and since 1793 has created a new business in the world. In England it gives employment to twenty-eight million spindles; and in Massachusetts alone to one million five hundred nineteen thousand five hundred and twenty-seven spindles, thirty-two millions dollars, and thirty-five thousand eight hundred persons. Thousands of vessels are employed in its transportation. In its growth it occupies about five millions acres of land in the Southern States, and can be raised, according to Hon. Dixon H. Lewis, for about three cents per pound. It is raised on land unfit for grass or grain, and the amount produced by each laborer is from eight hundred pounds to two thousand pounds. Besides what is raised in this country, large crops are grown in India and Africa, the former of these countries consuming three millions in her own manufactures. From these various countries the manufacturing states of Europe may obtain a ready supply; and it is a serious question whether we should benefit ourselves very materially by resigning to them the markets for cheaply manufactured cotton goods, while we were engaged in the more expensive operation of raising, and spinning, and weaving flax. I submit these facts for the consideration of our farmers, when they shall again be urged to convert their cornfields into flax grounds.

For myself, gentlemen, I would have Massachusetts devote herself to those products which are best adapted to her soil and climate—diligently, skilfully, and successfully. I would have her so strengthen herself, both by her internal economy and industry, and by all her civil relations, that no jealousies nor rivalries can interfere with her progress. I feel that she is entitled to her share of the markets of this continent, and that as she values the welfare of her people, she must secure the raw material for her manufactures, without being exposed to dangerous and destructive foreign competition. Her citizens are entitled to their proportion of the golden opportunities for future acquisitions to that republic of which she forms a part;

and she would be recreant, did she not rally to maintain that title. Beneath the flag of the Union, her commerce has freely traversed these western seas; shall she resign that freedom now? The history of the country is her history; the protection of the Constitution and the blessings of the Union are hers? And from her every hallowed battle-field, the blood of her fathers cries to her from the ground, to send forth her sons in defence of that republic in whose cause they fell. May the work of constitutional freedom begun at Lexington, and Concord, and Bunker Hill, be yet perfected on this continent. And while the sons of Massachusetts go forth to defend that government which is based upon equal rights to all, may we who, less favored, and reluctant, remain behind, cherish her institutions, and guard her interests, and beautify her soil, for the glory and honor of her future years of peace and prosperity.

And this day, set apart by the Chief Magistrate of the United States for national humiliation and prayer, calls upon us to remember our duties as citizens living under a constitution framed for the whole republic. For the confirmation of the rights and privileges conferred by that immortal instrument, we are involved in civil war. To protect that fabric, which has made us strong at home and abroad, and has extended the American power from sea to sea, the sword, sheathed when the battles of freedom were fought, has leaped again from its scabbard. As God shed down his strength upon the founders, so may He sustain the defenders of that fabric, everywhere. Not for a section, not for a party, not for a state, not for an abstraction or a dream, have our people rushed to arms; but to preserve the very foundations of our religion, and law, and education, and material greatness—to preserve our Government, to preserve our Union. In this work, shall any theory divide us, or any platform rule? It is a government for the East and for the West, for the North and for the South, for "every kindred, and nation, and tongue" on this continent, which demands all our care. Are there wrongs?—let them be redressed under the Constitution. Are there rights to be maintained?—let them be maintained under the Constitution. And not until all its guarantees are extended over every State and Territory, over every people and party, may this war cease.

If we fail to maintain this government, where shall we find another? If we do not fail, we may behold the temple erected by our fathers made more beautiful by the storm which has burst upon it. I think we shall then know what a free republic is. I think we shall then have learned to respect each other's rights. I think we shall have confirmed the work of self-government here. If this storm has burst upon us to clear the American sky of the clouds of disregard for the Union, forgetfulness of its blessings, and a desire for unconstitutional remedies for evils real or imaginary, which have been too long gathering from every corner of the heavens, those of us who survive it will have reason to thank God for the severity of the discipline. May we, then, as a people, rise to the magnitude of the contest, and bear ourselves with courage, and wisdom, and patience, and endurance, and liberality, until the cause of the republic shall prevail, and the glory of our nation shall be restored. And when God in his mercy shall have established peace within our gates and joy within our palaces, may the sentiment of loyalty which to-day exists everywhere, in spite of all trial and all oppression, break forth in triumph, for the commencement of a new and more glorious career of freedom on this continent.

THE FARMER'S CALLING.

From an Address before the Hoosac Valley Agricultural Society.

BY J. N. DUNHAM.

The great and pressing desire of man is to get rich—to get rich the quickest and easiest way is the study of nearly all; and men pursue the various branches of business within their reach, selecting for themselves the road to wealth. Skill, industry, and good luck combined, succeed. Skill and industry sometimes fail, and good luck occasionally succeeds, without the aid of either industry or skill. Some people are rich because they could not well prevent it, and some are poor because they cannot well be otherwise. Indolence and poverty do not always go hand in hand, neither does wealth and industry.

Farmers, like other men, desire to get rich, to own broad fields and large herds, to have fine horses, and to live in fine houses. All this is right, and they should be encouraged. I am glad to know that the farmers represented in this society are prosperous, and many of them wealthy. But farmers are not always content. The brilliant success of some of our manufacturers has at times created an uneasiness among certain of our farmers, and in some instances they have sold their farms to embark in other business, and have only awoke from their fanciful dreams of wealth, in the Court of Insolvency. When they witnessed the brilliant success of their neighbor, they failed to remember that two fortunes had been scattered at the same water-power. The success of the merchant at times looks large in the eyes of a farmer, but he fails to remember that the merchant's successor is reduced to poverty, and his neighbor across the way can pay but twenty cents on a dollar. He also sees the men of the professions, as he supposes, living easily; but he forgets that these men are the drudge servants

of society, dependent upon disease, disagreement and sin for their bread. He sees the men of the various branches of business, and sometimes regrets that he has chosen the business of tilling the ground. These visions of fancy occasionally dance before some farmer's eyes, and a majority of those who yield to them are ruined men.

The business of farming should not be made the stepping stone to any other business; farmers should strive to be better farmers. This business is open to great improvements, and to succeed as a farmer, intelligence and industry are required. A custom which has prevailed in our country to a considerable extent, has had a damaging effect among our farmers,—I mean the custom of farmers educating their sons who are to adopt the professions, and other branches of business, and neglecting such sons as are intended for the farm. Farmers have encouraged and aided their more hopeful sons to embark in lines of business, and given them a liberal education, while those they regarded less gifted have been less cared for, simply because they proposed to make farmers of them. This may not be true of any of the farmers in this society, but if it is I hope the evil may be remedied.

The business of farming requires the most extensive knowledge, to be carried on with success. Let the boy who is to become a farmer be thoroughly educated; let him study those branches which will fit him for his business, so that when he becomes a farmer he can bring his knowledge of geology, botany, and chemistry, to practical use. Let him know the soil, and bring the same skill and learning to bear in farming, as are brought to bear in some other branches of business, and these hills and valleys would fill our markets with abundance. Not that I would under-estimate the farmers in this society, far from that. Not but that you compare well with farmers through the county, for you do; but, I wish to be understood, that there is room for improvement, and you are capable of making that improvement.

Every plant, and every tree, and every kernel of grain is a volume of its own history; but we are too ignorant to read it. If we should be told that a learned and scientific farmer could examine an ear of corn, and could read its history, could tell how many days of sun it required to bring it to maturity, and

the composition of the soil in which it grew, we might hesitate before we believed it; but more strange statements are true. The history is written there, I have no doubt, but shall we learn the language in which it is written? Not by quietly farming, precisely as our fathers did; not by shutting our eyes and turning a deaf ear to science. The studious, observing farmer can now read imperfectly the language written upon the surface of the soil. He can spell a few words in the tree's own history. He can tell you their age—can understand the fruit trees, partially; but to be eminently successful, we must understand better. Science is not all learned at school or college. To a certain extent it may be learned in the field, and all farmers may study their farms, and profit by it. The skilful, educated, scientific farmer, ought to so study and understand his farm, as to be able to know the wants of his meadow, his pasture, and his tillage land; to know where to plough, when to plough, what to plant, what to sow, what fertilizer to use; to put ashes here, manure there, and lime and bone dust to be scattered just where they are needed. I do not suppose that all can avail themselves of the advantages of an agricultural school; but many may, and all may profit by it. And I desire to urge upon you the importance of the subject, and also to urge upon you the great propriety of giving those sons a good education who are designed for farmers; for the farmers do not hold such a position in the political and literary world as they deserve to. They do not hold such a position as their useful, honorable, and necessary employment and business fairly and justly entitle them to. We can ascertain from books and newspapers the knowledge and experience of others, and if farmers would but make the effort, they might not only manage their farms with eminent success, but might govern the state and the nation, for they in reality are the "lords of the land."

While I would urge the necessity of educating your sons to be farmers, I would not have the farmer's daughters neglected. They should be so educated and trained that they may be able to do the duties of a farmer's daughter, or a farmer's wife, if that should be their good fortune. While I would admire their skill in ornamental work and drawing, I would also be pleased with specimens of good butter and cheese worked by their own fair hands. And at a farmer's house his guests might be well

entertained by a few waltzes or polkas upon the piano, but might consider the entertainment ended if they had poor bread for tea. Let farmers' daughters learn the duties assigned them first—learn to cook, to make butter and cheese, and do general work—then the accomplishments. And they should not be deprived of participating in the study of the sciences. Their gardens, their flowers, the making of cheese and butter, and the general superintendence of a farmer's mansion requires a good, liberal education.

Many women have been eminently successful as farmers' wives, who have not had such advantages. We know of hundreds such, and we are proud of them. But perhaps they might have been more successful under other circumstances. The general appearance of a farm tells the story—it gives you the character of the farmer, and the appearance of the kitchen gives you the picture of the wife. The observing merchant who buys your butter, learns very soon who are neat, and who are not. He knows who do their work in season, and who out of season, and the wives and daughters ought to so understand it. It costs no more to make good butter than poor: it costs no more to be neat than to be dirty. I am glad to believe that the farmers' wives and daughters of this society are of the better class. The splendid specimens of butter and cheese which have been exhibited in this vicinity, have furnished abundant proof that wives and daughters perform their part well. Berkshire cheese has gained an enviable reputation in market, and our reputation will not suffer by reason of southern Vermont joining us; for the old Green Mountain State is not only noted for its fair women and brave men, but also for their unrivalled butter and cheese.

The business of tilling the ground is the most ancient of all kinds of business. The first man, Adam, was a farmer, commanded to till the ground by his Creator. And its usefulness and necessity have never been questioned. Honorable, profitable, and dignified—worthy the attention of the greatest and best men the world has ever produced—it is the foundation of society, the basis upon which all other kinds of business rests, and must rest.

The business of farming will be found by statistics, carefully prepared, to be the most profitable in the aggregate of all kinds

of business. But few fail. Farmers are not parties in the Insolvent Courts; they do not gain so rapidly as some do in other business, but surely and steadily. A famine never stares you in the face; you can live upon the productions of your own soil, independent of every-body. Your farm is a fortune, it is a home, however small, and many of our farmers would farm it more profitably if their farms were smaller. We find in history that when a country becomes densely populated, when necessity requires that the land should all be cultivated, and well cultivated, then we find that small farms are made to produce more than large farms do in our country, where our vast territories extend from ocean to ocean. If the land in the town of Adams was all tillage land, and should all be cultivated and made to produce as land in England has done, it might be made to maintain *one hundred thousand people;* for Goldsmith has told us, in one of his beautiful poems, that

> "The time was once, ere England's griefs began,
> When every rood of ground maintained its man."

I do not suppose that they lived extravagantly, or fared sumptuously every day, but they were supplied with the necessaries of life. They lived well, contented and happy.

Scarcity of land drives people to a good cultivation of it. And to you, who own small farms, remember that your little farm, well cultivated, will be more profitable than a large farm poorly managed. Never enlarge your farm till you have fully mastered what you have—know its capacity—test the strength of it. I am aware that it requires territory for pasture, but one acre of good pasture may be worth four acres of poor; one acre of meadow land, with two crops, may produce more than four acres of poor meadow, and perhaps more than ten acres. The profits of a farm are not always estimated by the number of acres; for, I think I can point out small farms that actually produce more profit to the owner than other farms, of three times the quantity of land. I do not claim but that some of our largest farms are well cultivated, for they are: our largest farmers are often our best farmers. But if scarcity of land compelled them to occupy smaller farms, they might perhaps farm it as profitably as they now do.

Allow me, my friends, to congratulate you in your useful, honorable, and profitable employment—you, who have assembled to exhibit your products, your cattle, and your fine horses. You may well be proud of your exhibition. You have not only gratified yourselves, but have pleased, and I hope profited us who come to see, but who had nothing to exhibit. You, too, I trust, have profited by this exhibition. This fair and exhibition has been a splendid success. Our Society is yet in its infancy, but the display here since the organization has shown that the farmers were in earnest. The ladies of this Society, too, have fully performed their part. The exhibition of their work is highly creditable to them, and pleasing to all. By the exhibition of the beautiful work of their own hands, they have shown their skill and ingenuity too plainly to be misunderstood. Ladies, you have shown that taste, skill, and industry which justly entitles you to the high position which you occupy, and you have abundant reason to be proud and rejoice that you are farmers' wives and farmers' daughters; that you have a home you can call your own—a home, quiet and undisturbed, free from contention and strife, free from the noise, dust, and the plagues of a city life—where you can look out upon, and roam in, the open green fields, and invigorate in that bracing pure air, which sweeps across the broad meadows, the grove, the orchard, and the pasture at the brook side.

At a time like this, when manufactures and commerce are crippled, when all kinds of business is depressed, when financial ruin stares the whole business community full in the face, when the factory spindles are still, when merchants have closed their stores, the farmer, the most independent and happy of all men, can rejoice that he is a farmer—that the house he lives in is his own, and should every man in the village fail he will still survive. He is affected by the panic, it is true; he cannot sell for cash, and get high prices, yet he can live. The farmer remains but little affected by the financial crash. He hears the noise, but is affected but slightly. Such is your position to-day, as farmers.

A rebellion, which has ripened into a war, is upon us—a war, terrible in its effects, uncertain in duration—a war which must prove disastrous to us, and worse than a disaster to those who have forced it upon us; and as dark clouds lower about our

head, as failure succeeds failure in the cities and towns, and high taxes are succeeded by a higher tax—as our brethren and friends are slain upon the battle-fields, or die of disease in our hospitals, our sons and brothers are called upon to enlist for the war, and sacrifice is succeeded by sacrifice. At times we are almost in despair, and say to ourselves: our once happy and glorious country has become a battle-field, and we are a ruined people—our end is bloodshed and disgrace. Such is one side of the picture presented, and we look upon the future with dark forebodings. So it appears; but while it is dark to the farmer, it is doubly dark to men of other business, and many a princely manufacturer would to-day shout for joy if he could exchange his decaying buildings, his rusting machinery, and his protested notes, for a farm in this valley, or upon the hill-tops. Gladly would he give up the uncertainty for a little substantial soil, with an humble but neat cottage located thereon, that he might call his home.

The farmer has a vital interest in the war which is upon us; the title of your land is at stake. Your farm has value that you know cannot fail. Land is valuable, be the government what it may. If our government proves to be a failure, too weak to protect itself, too inefficient to crush rebellion, too feeble to maintain the laws, then the very law which gives you the title to the farm you live upon, may also fail—your title is founded on law, and your hope in the future is in the enforcement of that law. Our strength is in our ability to maintain our laws, to protect the legal rights of all; and a blow to paralyze the law, is a blow at you. And it becomes the farmers to raise their strong arms in aid and support of the law of our country. Your all may be at stake; yet, in this contest it may not be in immediate danger, but the encroachment should now be checked.

But, friends, we trust that we shall meet here again, and that the dark pictures of war and rebellion will be removed from our view: that we may then meet under pleasant suns and a clear sky, with high hopes and happy realizations, knowing that our glorious old Union is unbroken, and that the old flag of "Red, White and Blue," with its thirty-four stars, floats in triumph over every State Capitol, from the Canadas to the Gulfs —from ocean to ocean. And we shall all rejoice that we raised

our hands in support of our country—once beloved, united, happy, glorious Union—that we may preserve and transmit it unbroken to our children, as it was transmitted to us by our fathers,—and, I think, I *know*, I speak your sentiments in saying that you will give your aid, and your strength, in aid of a government; that you will never yield your rights; that you will defend your birthplace, honor your fathers, and protect their tombstones; that if necessary, will lay down your life for your country, that you may transmit to your children the blessings of liberty, which have been transmitted to you by your fathers; that the soil, enriched by their blood and watered by their tears, shall forever be consecrated to freedom and equality; that you will regard it as good husbandry, not only to cultivate your farms but to defend them to the last, and guard well the spot where your fathers lie buried; and should it be necessary that the musket and sword should be added to the list of agricultural implements, I trust you will show yourselves accomplished, courageous, and brave, if compelled by necessity to bring them into actual service.

ESSEX.

UTILITY OF BIRDS.

BY WILSON FLAGG.

It may seem strange to some of our readers that there is a necessity, in the present enlightened age, to enter into a course of argument to prove the utility of birds to agriculture; they may be still more surprised to learn that the greatest enemies of the birds are among those classes whose occupation would be ruined, if they were for a single year wholly deprived of their services. We are accustomed to plead for the birds as beautiful and interesting objects, that deserve protection for their own sake, while we overlook their importance in the economy of nature. Valuable as they are for their songs, their lively motions, their gay plumage and their amusing habits, all these circumstances are of minor importance, compared with the benefits they confer upon man, as checks upon the over-multiplication of noxious insects. The fields are greener and the flowers more beautiful in the spring, the fruits of summer and autumn are fairer and more abundant, and all nature is preserved in freshness and beauty by these hosts of winged musicians who celebrate their garrulous revelries in the woods and pastures.

From a conviction that this general ignorance or imperfect appreciation of the services of birds may lead to momentous consequences, I propose to make a formal vindication of the feathered race, but shall not in any respect exaggerate their importance. I believe it admits of demonstration, that if the birds were exterminated, mankind could not subsist upon the face of the earth. Almost every species is indispensable to our agricultural prosperity. The gunner who destroys ten birds in the spring, secures the preservation of so many millions of injurious insects to ravage our crops, and to destroy the trees of our forests and our orchards. Naturalists, in general, will admit the great importance of their services; but cultivators,

who of all persons in the world ought to be the most familiar with the facts that prove their usefulness, are indeed the most ignorant of them; and they are so full of prejudices against the birds, that they attribute to them a full moiety of the mischief perpetrated by insects. There is perhaps not an insect tribe in existence which is not the natural food of some species of the feathered race, and which, if not kept in check by their agency, would multiply to infinity. Calculations have been frequently made, to ascertain the probable amount of insects consumed by single birds. Many of these accounts seem almost incredible; yet they will, for the most part, admit of demonstration.

Two different methods have been adopted for the purpose of ascertaining this class of facts; first, by watching the birds and taking note of their actions; second, by destroying individuals at different times and seasons, and examining the contents of their alimentary organs, to ascertain the quality of their food. Mr. Bradley, an English writer, mentions a person who was led by curiosity to watch a pair of birds that had a nest of young, for one hour. They went and returned continually, bringing every time a caterpillar to their nest. He counted the journeys they made, and calculated that one brood could not consume less than five hundred caterpillars in the course of a day. The quantity consumed in thirty, at this rate, by one nest, would amount to 15,000. Suppose that every square league of territory contained one hundred nests of this species—there would be destroyed by the birds of one species alone, a million and a half (1,500,000) of caterpillars, in the course of one month for every square league of agricultural territory.

I was sitting at the window one day in May, when my sister called my attention to a golden robin in a black cherry tree, devouring the common hairy caterpillars; and we counted the number he consumed while he remained on the branch. The time that elapsed was one minute by the watch, and during this space he destroyed seventeen caterpillars. But it is worthy of notice, that he did not swallow the whole insect. After seizing it in his bill, he carefully set his foot upon it, tore it asunder, and swallowed a small portion taken from the inside. He then seized others in succession, and in like manner selected and devoured his favorite morsel. Had he consumed the

whole caterpillar, five or six only would probably have satisfied his appetite. But this is not the general practice of birds that devour hairy caterpillars: they eat only an interior morsel, and require a proportionally greater number to satisfy their wants.

This observation led me to consider how vast an amount of benefit this single species of birds must contribute to agriculture. We will suppose that each bird spends, at different times during the day, sixty minutes, or one hour, in the aggregate, feasting upon this kind of food. This is not an extravagant calculation, since he undoubtedly employs nearly twelve hours of the twenty-four in searching for food, and we may suppose a twelfth part of this time devoted to this description of foraging. At the rate of seventeen per minute, each bird would destroy a little more than one thousand caterpillars in the course of each day. We may rationally conclude from this calculation, even if we reduce it to one-half the amount, this species of birds must destroy an immense quantity of these vermin during the three or four weeks of the caterpillar season, and that they must serve as a most important check upon their multiplication.

It it recorded in "Anderson's Recreations," that a curious observer, having discovered a nest of five young jays, remarked that each of these birds, while yet very young, consumed daily at least fifteen full-sized grubs of the May-beetle, and would require many more of a smaller size. The writer makes a calculation founded on the supposition that they would require, of large and small, about twenty each for their daily supply. At this rate, the five birds together would consume 100. Allowing that each of the parents required 50, the family would consume 200 every day; and the whole amount in three months, or one season, to 20,000. The writer, I would remark, commits an error in supposing that the old birds consume more than their young; whereas they feed upon comparatively few soft insects, or grubs, giving these to their young, while they make their own meals upon the hard and coriaceous insects. The old bird consumes, for example, the beetle, while he feeds his young upon its larva.

In obedience to a similar instinct, many of the granivorous birds, as the sparrows and finches, while they live chiefly upon seeds, feed their young entirely upon the larva of insects.

Almost every finch and sparrow is, therefore, insectivorous for the first few weeks of its existence, not consuming seeds or grain, until it has learned to provide for its own subsistence. The old birds supply their young with larva, when this kind of food is abundant, and when the tender state of their digestive organs requires the use of soft food. Thus nature has provided that even the granivorous birds should act as checks upon the multiplication of insects, during the early stages of their existence. The exceptions to this practice are the pigeon tribe, that soften the grain in their own crops, before they give it to their young; and the hemp-birds, who wait until the seeds of grasses and other plants are in the milk, before they bring their young into the world, and then feed them upon the soft milky seeds.

The quantity of grubs and insects consumed by the feathered race is infinite, and beyond all calculation; and the facts related of them show that birds require a much larger proportion of food, compared with their size, than quadrupeds. My own experience corroborates the accounts which I have selected from the testimony of other observers. I took from their nest two young bluebirds, which are only half the size of a jay, and fed them constantly with my own hand for the space of two weeks. These little birds would swallow twelve or more large muckworms apiece daily, when they were supplied with them, or other grubs or worms, in the same proportion, and still seemed eager for more, and not over-fed. Another experiment which I made with two young cat-birds, was attended with results equally surprising. Their voracity convinced me that the usual calculations bearing upon this subject are not exaggerated.

The usefulness of birds has been repeatedly demonstrated by dissecting them, and examining their alimentary contents. This method of studying their feeding propensities is not attended with any liability to mistakes. When we watch a bird at a distance, we cannot be sure, in all particular instances, of the character of his prey; but if we find his crop or his gizzard full of insects of a certain species, we cannot feel a rational doubt that such insects are his natural food. And when we consider that insect food is digested with much greater rapidity than grain or seeds, we have reason to infer that each bird

must fill itself with insects at least five or six times a day in order to supply his alimentary wants. If a hundred insects, therefore, of any kind are found at one time in the crop of a bird, upon dissection, we may believe that this number is no more than a fifth part of the quantity he consumes in the course of one day. It is worthy of remark that a very small part of any insect or grub is nutritious, the most of it consisting of its shelly coverings and hairy appendages; we ought not to be surprised, therefore, that a bird must swallow a large quantity of insects to obtain a small quantity of nourishment.

There is one circumstance connected with the examinations of a bird's alimentary contents, that has often led to false inferences. It is a fact that a few kernels of corn, taken by the bird in the morning, will frequently be found in the gizzard at night, while a whole multitude of insects and grubs, swallowed at a later period of the day, are entirely digested, and have disappeared from the contents of the stomach. If a blackbird, having swallowed a few kernels of corn in the morning, and afterwards more than a quarter of a pound of insect food, be killed by a jealous farmer at night, he would believe, upon dissecting it and finding only a few kernels of corn in its gizzard, that he had ocular proof that the bird fed almost exclusively upon corn. The insect food has digested and disappeared, while the corn remains almost unaltered; for it is remarkable, that if several kinds of food are swallowed by an animal, and especially by a bird that does not masticate its food, the digestive organs will select that portion which is most needful to supply the wants of the system, or that which is most agreeable to its nature, and not until all this is digested will it act upon the remainder. By experimenting upon poultry, this fact may be clearly demonstrated.

But I will now proceed to relate a few facts, which I have selected from a variety of sources. A farmer's boy in Ohio, observing a small flock of quails in his father's cornfield, resolved to watch their motions. They pursued a very regular course in their foraging, commencing on one side of the field, taking about five rows, and following them uniformly to the opposite end. Returning in the same manner over the next five rows, they continued in this course, until they had explored the greater portion of the field. The lad, being suspicious that

they were pulling up the corn, fired into the flock, killing one of them, and then proceeded to examine the ground. In the whole space over which they had travelled, he found but one stalk of corn disturbed; this was nearly scratched out of the ground, but the kernel still adhered to it. In the craw of the quail he found one cutworm, twenty-one striped vine-bugs, and one hundred chinch-bugs; but not a single kernel of corn. This is an important fact; for as the quail is a granivorous bird during a great part of the year, it proves that the usefulness of birds, as destroyers of insects, is not confined to the insectivorous tribes.

Mr. Roberts, a farmer who resided in Colesville, Ohio, communicated an important fact to one of the papers of that State. A neighbor asked his assistance in killing some yellow-birds which the farmers accused of destroying their wheat. Mr. Roberts declined, because he did not believe their accusations, and was inclined to cherish and protect the birds, as the farmer's friends. Out of curiosity, however, he killed one of the yellow-birds, and opened its crop, when he found that *instead of the wheat, the bird had devoured the weevil, which is the great destroyer of wheat!* He found as many as two hundred weevils in the bird's crop, and but four grains of wheat; and as each of these contained a weevil, they were undoubtedly eaten for the sake of the insect within them. The jealousy of the Ohio farmers was prompting them, in this case, to destroy a race of birds that were constantly performing for them an incalculable service.

By Southern farmers, the kildeer, a sort of plover, is supposed to destroy young turnips. A writer in the "Southern Planter," alluding to this notion, pronounces the kildeer the true guardian of the turnip-field, remarking: "I have several times dissected the gizzards of kildeers—for they have no crops—to show their destroyers that they contain no vegetable substance; and nothing, indeed, but the little bug so famous for destroying young turnips and tobacco plants. These little hopping beetles are a great nuisance in the land, and seem to be rapidly increasing. The kildeers are their natural enemies, and formerly collected in large numbers to fulfil the purposes of their mission. I seldom, now-a-days, hear the kildeer's voice. Let no man, henceforth, kill one, except to convince himself

and others that they eat no young turnips. The sacrifice of one producing such conviction may save hundreds of his brethren."

The testimony of practical gardeners in favor of birds deserves special consideration, because their prejudices incline them to seek their destruction. Mr. Musgrave, a practical gardener, who has written a treatise on the means of destroying injurious insects, remarks: "It is a too common practice among gardeners, to destroy, indiscriminately, the birds that frequent their grounds. This, in my opinion, is bad policy. Although some birds are great enemies to certain crops, it must be a trifling crop indeed that will not bear the expense of a person to watch it, or a net to protect it until it is out of danger; for the birds perform a double office—eating up the vermin from the trees, and the seeds of weeds and the eggs of insects from the ground. I have often stood and observed the male bird, while the female was sitting on the nest, fly to the spot with his bill full of caterpillers to feed his mate or young; and when the young ones became so strong as to accompany their parents in quest of food, the number of caterpillers they destroy is astonishing. I can say from my own observation, that were it not for the labors of birds in this direction, our trees would exhibit nothing but bare stumps." Mr. Musgrave one day followed a nest of young birds that had just flown, for the purpose of observing the actions of the old birds. He saw them fly from branch to branch, and peck the caterpillers from the curled leaves, carrying them immediately to their young. It is his opinion, therefore, that the gardener should protect the birds as useful allies, and avail himself of their services, by means of which, united with his own efforts, he might rid his grounds of those insects which have hitherto been a constantly increasing pest.

In 1826, insects of various kinds had become so universally destructive, as to cause serious apprehensions for the safety of all kinds of products. One of our horticulturists communicated his opinions on this subject to the "Massachusetts Yeoman," expressing his belief that the unusual number of these destroyers was occasioned by the destruction and diminution of those feathered tribes, which are designed by the Creator as a check upon the increase of insects and worms. His neighbors expressed their astonishment that every thing in his garden should look so thrifty and flourishing, while every plant in

theirs was cut down and destroyed, almost as soon as it sprang up, by these vermin. "I have no concern about it," he replied; "my robins see to that. I preserve them from their enemies—the boys and the cats—and they preserve my garden from insects and worms. In one corner of my garden, near my dwelling, is a tree in which a couple of these friends of man have reared their families for three successive years. There has ever been a harmony between my birds and me." This was the whole explanation of the healthfulness of the fruits and vegetables in his garden: he preserved all the birds in his garden, and they devoured the insects that infested it. Grasshoppers, he said, in the early stage of their existence, and for some weeks after their appearance, are not larger than flies; and ten or twelve birds would clear a whole field of them, before they could be large enough to do any injury; and he besought all parents, as they valued their property and the blessing of Heaven, to prevent their boys from shooting robins and other birds.

It is well known that the small owls are useful as destroyers of the larger moths and nocturnal insects; they are also excellent mousers. The Hon. Richard Peters, in "The Memoirs of the Philadelphia Society for Promoting Agriculture," remarks of a small species of owl: "The numbers of mice, moles and other vermin destroyed by the short-eared owl are truly surprising. All the owl tribe are mousers. A pine tree, spreading and thick-set, near my house, affords a shelter and roost to about a dozen of these owls through the winter." He therefore enjoyed the opportunity of witnessing their operations; and a few of them, for they are generally gregarious, will soon, in his opinion, clear the barn and out-houses of a farm, as well as the fields, from vermin, in the vicinity of their resort. Farmers, he said, should encourage the small owls to reside near their buildings, and invite their visits in every way, for it is only the larger species that will attack poultry, or commit damages of any sort.

The different habits of foraging that distinguish the several tribes and species of the feathered race, deserve attention, as indications of a corresponding difference in the character of their food. Those, for example, that seek their food chiefly from the surface of the ground, would forage in a different

manner from those species that collect it from under the surface. The swallows, that catch all their food while on the wing, give proof by this habit that they pursue only winged insects; but their habits of foraging differ very essentially from those of the pewees, who also catch all their food while on the wing. The robin and the red-winged blackbird take their food entirely from the ground; but their ways, while seeking it, are very different. Their respective habits of foraging are adapted to the successful pursuit of the worms and insects that constitute their principal food; for although each of these birds will devour the same kind of insects that come in their way, they make certain kinds, respectively, the chief objects of their pursuit. It is necessary to study all the different habits of foraging, that mark the several species, in order fully to comprehend the principle which I wish to inculcate—*that each species of bird performs certain services in the economy of nature, which cannot be so well accomplished by any other species*—and that it is necessary, therefore, for this end, to preserve them all in their due proportions; that is, in such proportions as would spontaneously exist, if the whole race were unmolested and left to their own natural chances of living and multiplying.

The Sylvians are among the most interesting foragers of the smaller birds, and are remarkable for their apparent diligence in hunting for insects. They have a peculiar way of examining the foliage and blossoms, rather than the surface of the branches, and their motions are, therefore, very conspicuous upon the outer surface of the trees, near the extremities of their branches. The golden robin hunts his food like the Sylvians, though he is not one of them, and his motions are more rapid and energetic than theirs. He arrives with the first blossoming of the cherry trees, a coincidence which I have noticed and recorded for several years past. This beautiful bird is fond of certain insects that abound upon the leaves and blossoms of trees; and his northerly progress is probably regulated by this supply, that comes along with the opening of spring. No sooner does he arrive than he may be seen rigorously examining the leaves and blossoms, and catching small beetles and moths which are concealed upon the under surface of the foliage, and in the cup of the flower. This bird is con-

sidered omnivorous, but I am convinced that during the months of spring and summer, his diet consists almost entirely of insects.

The wren, the creepers and the tomtits seek their food by creeping round the branches, and take less of their food from the foliage than either the Sylvians or the Fly-catchers. They seldom pause in their circuitous course, proceeding usually from the junction of the branches to their extremity, then hopping to another branch, and proceeding upwards till they are satisfied and pass to another tree. The Sylvians always appear to examine the leaves and blossoms, while the creepers and tomtits examine more carefully the bark of the tree. Hence the Sylvians do not prolong their stay with us after the fall of the leaf, while the others are seen after the trees are entirely denuded, leading us to infer that the one feeds chiefly upon beetles and other insects which are most abundant in the summer months, while the others subsist upon insects in their embryo forms, which, during autumn and winter, are concealed in the crevices of the bark of trees.

The habits of the Fly-catchers are quite different from those of any of the species I have just named. Let us take the pewee for an example. He sits on the bough of a tree almost motionless, except a frequent sidling of the head, indicating his watchful condition. He does not seem to be so diligent as the Sylvians; but that he is not idle is shown by his frequent flitting out, in an irregular circuit, and immediately returning to his perch with a captured insect. These salient flights are performed as often as once in four or five seconds, and he often turns a summerset in the act of capturing his prey when it tries to elude him. He seldom misses his aim, and probably collects ten or fifteen insects every minute, of an appreciable size. As he lives entirely upon them, and is also, in the early part of summer, engaged in supplying the wants of his young, this is no extravagant estimate.

The pewee does not catch all his food while it is on the wing, but he is always on the wing when he takes it. If he sees a moth or a beetle upon a leaf or a branch, he flies to it and seizes it while he is poised in the air. A Sylvian would stand upon the branch and extend his neck forward to take it. The Vireos, which form an intermediate genus between the

true Fly-catchers and the Sylvians, partake of some of the habits of each; and some of the species are remarkable for a habit of singing while they are foraging. The warbling Vireo seems, indeed, to make singing his principal employment; he is never apparently very diligent or earnest, and often stops in the middle of a strain to seize a passing insect, and then resumes it. All the true Fly-catchers, including the king-bird, resemble the pewee in their general habits of foraging.

Here, then, we observe several circles; the outer one occupied by the true Fly-catchers, who sit in wait for all such insects as discover themselves flitting among the foliage of the tree, or outside of it; the circle next the outside is occupied by the Sylvians, who search for their food by creeping about among the leaves and flowers; and the inner circle by the creepers and tomtits, or chickadees, that hunt the bark and incrustations of the branches for their prey. Inside of this interior circle is the space occupied by the woodpeckers, who live upon the larva which is concealed in the solid substance of the wood and bark, and lies beyond the reach of the creepers and chickadees, who cannot bore into the wood. Lastly, outside of the outer circle just described, is the space occupied by the swallows, who take all their food while it is afloat in the atmosphere.

The woodpeckers have a long tongue of great flexibility, and a powerful beak. They have also a sagacious instinct that directs them how to discover their prey, without the exercise of their sight. They listen carefully for the scratching sounds of the grub while it is gnawing the wood, and having determined its exact location, they hammer upon the spot with their beak, seize their victim, and draw him out with their long tongue. The old birds are said to teach their young the art of hunting this larva, and nature has made them very easy learners. By the opposite arrangement of the fore and hind claws, these birds are enabled to climb a tree in all directions in search for their prey.

Woodpeckers live mostly in the forest, of which they are the natural guardians; and as the food of their choice is nearly as abundant in winter as in summer, they are not generally migratory. Hence the operations of these birds are incessant throughout the year. As their food is not anywhere very abundant, like that of some of the granivorous birds, wood-

peckers are never seen foraging in flocks. The more they scatter themselves, the better is their fare. All birds that assemble in dense flocks, except the aquatic tribes, are either entirely granivorous, like pigeons, or partially so, like blackbirds. Woodpeckers are indefatigable devourers of emmets, taking them not only from the surface, but also drawing them and their larva out of the crevices of timber. It is hardly possible to overestimate the services performed by this tribe of birds, in their ceaseless operations among the trees.

Thus far I have treated only of birds that take their food chiefly from the foliage, flowers, and branches of trees and shrubs—the natural guardians of the forest and orchard. But there are many tribes that seldom take any thing from trees, and confine their foraging almost entirely to the surface of the ground. Such are the pigeons, all the gallinaceous birds, larks, blackbirds, snipes and thrushes. These are the guardians of the soil; and may also be made to assume an arrangement analogous to the circles above described. For example, the snipe, the woodcock, the plover, and their allied species, feed chiefly upon worms and insects that live underneath the surface, digging under it for their prey with their long bills. They occupy a position analogous to that of the woodpeckers. Larks, quails, thrushes and blackbirds gather the principal part of their food from the surface, seizing only upon those underneath it, which are partly exposed to sight.

The thrushes forage mostly upon the surface of the ground. Though they do not refuse an insect or a grub discovered upon a leaf or a branch of a tree, they hunt their food upon the bare soil or the green sward. One circumstance that attracts frequent attention in the feeding habits of the thrushes, is their apparent want of diligence; but this appearance is delusive, for the immense quantity of insects consumed by them could not be obtained without proportional industry. The common robin will exemplify the general habit of the thrushes, though he carries their peculiarities to an extreme. When he hunts his food, he is usually seen hopping listlessly about the field. Sometimes a dozen robins, or more, may be seen in one field, but they are always widely separated. Observe one of them, and you will see him standing still with his bill inclined

upwards, and looking about him with seeming unconcern. Soon he makes two or three hops, and then stands a few more seconds apparently idle. Presently he may be seen pecking vigorously upon the ground, when, if you was near enough to see it distinctly, you would find that he is pulling out a cutworm from his retreat, or devouring a nest of insects which are gathered in a cluster. The robin consumes earthworms also when he cannot obtain grubs, which he always prefers.

Blackbirds, though they also gather their food from the ground, seem to be more industrious. These birds walk; they do not hop like the robin, and they seldom hold up their heads, but march along with their bills turned downward, as if entirely devoted to the object of their search. They never seem to be idle, except when a flock of them are making a garrulous noise upon the trees. If a blackbird looks upward, it is only by a sudden movement, and he never stops. After watching him and the robin five minutes in the same field any one would lay a wager that the blackbird would collect twice as much food as the robin in that time. But this would be a mistake; and the difference in their apparent industry proceeds from the different character of their food. The robin is entirely insectivorous, and rejects all seeds and farinaceous food, while the omniverous blackbird hunts the soil for every thing that is nutritious, and pecks up millions of small seeds which require a close examination of the ground.

The robin is probably endowed with a greater reach of sight than the blackbird; and, while hopping about with his head erect, his eyes comprehend within their visual grasp, a very wide circumference. He not only watches for a sight of his prey but also for those marks upon vegetation that denote the place of its concealment. When we look among our young cabbages, that, if we see a plant cut down, we may draw out from its hole the cutworm that has done the mischief; if we do not find it, we may be sure that the robin, who understands the indications as well as any gardener, has been there before us. The robin must possess an extraordinary portion of this sagacious instinct, for the thousands of cutworms destroyed by him could not possibly be discovered, except by these indications. The far-sightedness of the robin is equally remarkable in the blackbird, who, though he takes a large portion of his

food from the ground, always discovers it while perched upon a tree or a fence, and darts down upon it from his perch. It is evident that birds of certain species must be endowed with a much greater power of sight than quadrupeds, to enable them to discern their prey from distant stand points.

The foraging habits of the different species of domestic poultry are worthy of remark, and may seem to illustrate some of the differences observed in the habits of the wild birds. Place a brood of ducks in a field, in grasshopper time, and they will all pursue one course, marching in a body over the field, with great uniformity. A brood of chickens, on the contrary, will scatter in all directions, occasionally re-assembling, but never keeping close together, nor following any definite line of march, except when they are led by the mother hen. Turkeys scatter themselves less than chickens, but do not equal ducks in the regularity of their movements. Pigeons settle down upon a field in a compact flock and immediately radiate in all directions. Geese do not separate widely from each other, but they preserve no line of march like ducks, because they are not in pursuit of insects, but feed upon grass and keep together after the manner of a flock of sheep.

Of all birds the most interesting foragers are those that seek their food in compact assemblages. This habit it is that renders the snow bunting so attractive. Their food is not distributed in separate morsels, like the food of robins or of woodpeckers; but consists chiefly of the seeds of grasses and composite plants, which are scattered somewhat evenly and profusely over a wide surface. When, therefore, they settle down upon a field in a flock of a hundred or more, each individual fares as well as if he were entirely alone. But we may be justified in drawing this inference from the foraging habits of birds, that as a general rule, the gregarious birds are not so useful to agriculture as the solitary feeders or those that feed in straggling flocks. Insect feeders, for the most part, find it profitable to scatter and keep separate, because their food is sparsely distributed. This is not true, however, of the birds that frequent the salt marshes, where their food is widely and evenly spread like seeds in a grassfield. Hence plovers, sandpipers and their allied species, forage in flocks, like the

granivorous birds, though they feed exclusively upon an animal diet.

I have said nothing of the foraging habits of the swallow tribe, for these are very well known and understood. The swallows are the guardians of the atmosphere, which would otherwise swarm with fatal quantities of minute insects; the woodpeckers are the guardians of the timber of the forest, and the Sylvians and Fly-catchers of the foliage. Blackbirds, plovers, larks and thrushes are the natural guardians of the soil and of the creeping herbage. Each tribe has its respective duty to perform in the economy of nature; and man must beware how he disturbs her equilibrium, by reducing the numbers of any species below the amount of supplies which the insect world affords them.

It is curious to notice the assiduity with which insects are hunted in all the various stages of their existence. In their larva state, those that lurk under the soil are hunted by blackbirds, by thrushes and by the common robins, who easily detect their hiding places by the appearance of vegetation. Those infesting the wood and bark of trees are hunted by woodpeckers who are no less sagacious in discovering the retreat of their prey and dislodging it. When the larva has assumed the form of moths, beetles and other perfect insects, these are attacked by bluebirds, wrens, Fly-catchers and hosts of other birds, who watch for them in all situations, in the daytime: and in the night by whippoorwills, nighthawks and the little owls. It matters not in what stage of its existence the insect is destroyed; but it is demonstrable that the insect tribes cannot be kept in check, unless they are attacked in all the stages of their being; and birds are their only effectual destroyers. Man cannot by direct means cause their destruction, except in particular locations. He cannot be a general destroyer; and their general over multiplication can be checked only by nature's own agents which she has appointed for this end.

Before I conclude this branch of my subject, I wish to say a word in behalf of one of our most useful birds. I allude to the little spotted tattler or peetweet, a species of plover that breeds annually in our fields, and would multiply and become very numerous if the species were protected. These little birds are so mercilessly hunted by gunners of all ages, that they have

become extremely shy and have lost all confidence in man. Yet if they were harbored and protected from annoyance and danger, they would be tame and confiding, and our fields and gardens would be full of them. They are the most indefatigable hunters of insects, in pastures and tilled lands, and they lead their young after them as hens do. A few pairs, with their young broods would perform incalculable service on every farm; and if encouraged and protected they would soon reward us with their confidence and their services. These little birds are incapable of doing any mischief; they steal no fruit; do not bite off the tops of tender herbs; they are interesting in their ways, and the only cause of their scarcity is the shameful destruction of them by wanton gunners.

The consequences which have followed the destruction of birds, as related in many well authenticated instances, afford one of the most convincing proofs of their utility. Professor Jenks mentions a case communicated by one of his female correspondents, which is worthy of record. In former times, as she had been told by her father, an annual shooting match took place on Election day in May. On one of these occasions, about the year 1820, in North Bridgewater, the birds were killed in such quantities, that cartloads of them were sold to the farmers for fertilizing the soil. There was consequently a great scarcity of birds in all that vicinity. Soon the herbage begun to show signs of injury. Tufts of withered grass appeared, and spread out widely into circles, of a seared and burnt complexion. Though the cause and effect were so near each other, they were not logically put together by the inhabitants at that time. Modern entomology, however, would have explained to them the cause of this phenomenon, in the increase of the larvæ of injurious insects, usually kept in check by the birds which had been destroyed at the shooting match.

After the abolition of the game laws in France, at the close of the last century, the people being used to regard birds as the property of great land owners, instead of the free denizens of nature, destroyed them without any limits. Every species of game, including even the common singing-birds, was threatened with extermination. It was found necessary, therefore, to protect them by laws that forbade hunting at certain seasons. It is only by such unfortunate experience that men can learn

that if they eat the birds, the birds cannot protect them from famine. The most serious evils were produced; the farmers' crops were destroyed by insects, and the gardens and orchards produced no fruit. Investigations of the cause of these evils by ingenious naturalists, proved them to be the direct consequence of the extermination of birds.

Some years ago in Virginia and Carolina several tracts of forest were attacked by a malady which caused the trees to perish over hundreds of acres. A traveller passing through that region, inquired of a countryman, if he knew the cause of this devastation. He replied that the whole mischief was done by woodpeckers; and though the inhabitants had killed great numbers of them, there still remained enough to bore into the trees and destroy them. The traveller, not satisfied with this account, made some investigations, and being an entomologist, he soon convinced them that the cause of the mischief was the larva of a species of the Buprestis, which had multiplied beyond all bounds. This larva was the favorite food of the woodpeckers, which had congregated lately in that region, on account of the abundant supply. He proved to them that they were ignorantly engaged in protecting the real destroyers of the forest, by warring against the woodpeckers, which, if left unmolested, would nearly eradicate this pest. Birds become accustomed to certain locations; and if, by any accident, a certain region happens to be deserted by them for a season, insects of all kinds gain a start and destroy vegetation.

"In the year 1798, the forests in Saxony and Brundenburg were attacked with a general mortality. The greater part of the trees, especially the firs and the different kinds of pine, whose bitter and aromatic branches are rarely the prey of insects, died, as if struck at the roots by some secret malady. It was not here, as often happens, that the foliage above was devoured by caterpillars, the trees perished without showing any signs of external disease. This calamity became so general, that the regency of Saxony sent naturalists and skilful foresters to find out the cause. They soon found it in the multiplication of one of the lepidopterous insects, which in its larva state, insinuated itself within the tree, and fed upon the wood. Whenever any bough of the fir or the pine was broken, this detestable insect was found within it, which had often hollowed

it out even to the bark. From the report of the naturalists it was made apparent *that the extraordinary increase of this insect was owing to the entire disappearance of several species of woodpecker and titmouse*, which had not for some years been seen in the forest."

Doctor Lettsom, an English physician, remarks that he was assured by an intelligent farmer, that, notwithstanding the power of severe frost to kill insects, they are always most numerous after a cold winter, because the birds are prevented from finding them by the hardness of the soil. When a hard frost binds the surface of the ground it protects the dormant insects from the birds no less than it exposes the insects to injury from the cold. It would seem, therefore, that nature, while providing checks to the over-multiplication of insects, has carefully guarded them from extermination, by taking care that when they are more than usually exposed to one agent of their destruction, they shall at the same time be less exposed to another.

Buffon relates the following anecdote of a certain species of grackle, resembling our crow blackbird, which is so injudiciously destroyed by the farmers in the vicinity of Boston: "The Isle of Bourbon, where the grackle was unknown, was overrun with locusts, which had been accidentally introduced from Madagascar; the eggs having been imported in the soil with some plants which were brought from that island. The governor-general and the intendant deliberated seriously on the means of extirpating these noxious insects, and for this purpose caused several pairs of the Indian grackle to be introduced into the island. This plan promised to succeed; but unfortunately, some of the colonists seeing the birds eagerly thrust their bills into the earth of the newly sowed fields, imagined they were in quest of grain, and reported that the birds, instead of proving beneficial, would be highly detrimental to the country. On the part of the birds it was argued, that they raked in new-ploughed grounds, not for the sake of the grain, but for the insects, and were, therefore, beneficial. They were, however, proscribed by the council; and in the space of two hours after the sentence was pronounced against them, not a grackle was found in the island. This prompt execution was followed by a speedy repentance. The locusts gained the ascendancy, and

the people who only viewed the present, regretted the loss of the grackles. In a few years afterwards, a few pairs were again introduced; their preservation and breeding were made a State affair; the laws held out protection to them, and the physicians, on their part, declared their flesh to be unwholesome. The grackles accordingly multiplied, and the locusts were destroyed."

Kalm remarks, in his "Travels in America," that after a great destruction made among the purple grackles and crow blackbirds, for the legal reward of three pence per dozen, the Northern States, in 1749, experienced a complete loss of the grass and grain crops, from the devastation of insects and their larva. The crows of North America were likewise, some years since, in consequence of premiums offered for their destruction, so nearly exterminated, that the increase of insects became alarmingly great; and the States were obliged to offer counter-rewards for the protection of crows. The same incident has frequently happened in other countries.

The protection afforded in Europe to rooks, a species allied to our common crow, and resembling it exactly in its habits of feeding, may be quoted as a lesson to Americans, who consider the crow as only a mischievous marauder. The rook feeds upon corn and all kinds of grain, but he is protected, on account of his services as a consumer of insects in all their forms. Rooks are often seen in such numbers upon newly ploughed land in England, as to blacken it with their plumage. Yet the laborers in the field do not molest them, though they must be watched to prevent their doing mischief by destroying green corn. In spite of all this, they are reckoned among the farmer's friends, and are exempted from molestation. Crows do the same kind of mischief, and they are also equally serviceable to agriculture; but they are destroyed without mercy. John Randolph was so well satisfied of their utility that he would not allow a crow to be shot upon his farm; and to prevent their depredations, he fed them liberally at such times as his young corn was likely to be injured by them.

"On account of the propensity of rooks to consume grain and other seeds," Mr. Selby remarks, "they have erroneously been viewed in the light of an enemy by most husbandmen, and in several districts in England, attempts have formerly

been made, either to banish them, or to extirpate the breed. But whenever this measure has been carried into effect, the most serious injury to corn and other crops has invariably followed, from the unchecked devastations of the grub and the caterpillar."

An intelligent observer in Virginia, calling himself an aged man, communicated some important information to the "Southern Planter" in 1860, respecting the services of birds. He remarks that since his boyhood, there has been a rapid decrease in the number of birds, and a proportional increase of insects. Among the consequences of this multiplication, he mentions destructive depredations upon the farmer's crops, by clover-worms, wire-worms, cut-worms, and on the wheat crops particularly by chinch-bugs, Hessian flies, joint-worms and other pests. He thinks it demonstrable that the excessive multiplication of these injurious insects is due to the scarcity of birds. He speaks particularly of the diminution of woodpeckers as a public calamity. He has known a community of red-headed woodpeckers to actually arrest the progress of destruction from borers in a pine forest. He mentions the large-spotted woodpecker, called in New England the flicker, as the only bird he ever saw pulling out worms from the roots of peach trees. Such a habit must cause the destruction of millions of orchard borers, which are mostly found near the roots of trees.

The Abbe St. Pierre remarks: "There are insects, noxious in their nature, that prey upon our fruits and our corn. But if snails, May-bugs, caterpillars and locusts ravage our plains, it is because we destroy the birds of our groves that live upon them; and because when importing the trees of foreign countries into our own, we import at the same time the eggs of the insects which they harbor, while the birds of the same climate —the destroyers of those insects—are left behind. Every country has birds peculiar to itself for the preservation of its plants. I have seen at the Cape of Good Hope, a species called the gardener's bird, incessantly employed in destroying the worms and caterpillars, which, as he caught them, he stuck on the thorny prickles of the bushes. I have likewise seen in the Isle of France, a species of starling, called the martin, that comes from India, and lives on locusts and other

insects that infest cattle. Naturalize these birds in Europe, and no scientific discovery ever made would prove so beneficial to man. But the birds of our own groves would perhaps be sufficient of themselves to clear our plains of these inconveniences, were the bird-catchers forbidden to entrap them.

"A fancy, some years ago, prevailed in Prussia, of proscribing the race of sparrows, as inimical to agriculture. Every peasant was subjected to an annual capitation of twelve heads of this species of bird, which were employed in the manufacture of saltpetre; for in that country nothing is wasted. At the end, however, of the second year, it was discovered that the crops were devoured by insects, and it was speedily found advisable to invite the sparrows from the neighboring counties to re-people the kingdom with them, and remedy the evil. These birds, it is true, when insects fail them, eat some grains of wheat. But insects, be it remembered, consume it by bushels, and even by granaries. Meanwhile, if the whole race of insects could be destroyed, it would not be expedient to attempt it, since there would be destroyed along with them most of the feathered tribes of our plains, which, during the season of breeding, have no other food for their young."

The inhabitants of a new country, like our own, are not so well informed of the evils that follow the destruction of birds, as those of old countries who have learned by tradition the indispensable character of their services. Vincent Köllar says, a judicious method of setting a limit to the excessive increase of the cockchafer, is to spare the birds that feed upon the larva of this insect. Among these, he thinks the crow undoubtedly claims the first place. "These birds," he says, "follow the plough, for the express purpose of consuming worms, the larva of insects, and particularly that of the cockchafer, when thrown out on the surface by the plough. The instinct of the crow to go in quest of this grub, may also be observed in gardens and other places where vegetables are planted. He walks about between the plants, and when he sees one that has begun to wither, digs with his sharp bill deep into the ground, near the plant, and knows so well how to seize his prey, that he draws it forth and swallows it almost at the same moment. The crows do the same in the meadows, which we see sometimes completely covered with them."

The American crow, though addicted to the same habits, is made shy and timid by the persecution he suffers; for our farmers can never believe the crow is seeking after any thing but corn, of which, it has been well ascertained, he will eat but a very small quantity, though it were placed constantly before him. The same results might be obtained, however, by encouraging other birds that seek this grub as their favorite food. Such are the common crow blackbird or purple grackle, one of the most useful of the farmer's friends, the red-winged blackbird and the meadow lark. The robin takes vast quantities of cut-worms that do not lie so deep in the soil, but he does not dig into the earth like the birds just named. The most useful birds are those which are likewise the most mischievous on certain occasions, the blackbirds by stealing corn, and the robin by stealing cherries. One of our most useful birds, among the smaller species, is the wax-wing, which, on account of his ceaseless depredations in the cherry trees, is known by the familiar name of the cherry bird. Prof. W. D. Peck, in his "Prize Essay on the Natural History of the Canker Worm," remarks: "The principal check provided by nature upon the too great increase of this insect, is the *Ampelis Garrulus* of Linnaeus, called by Mr. Catesby the Chatterer of Carolina, and in Rev. Dr. Belknap's History of New Hampshire, the cherry bird. This bird destroys great numbers of them, while in the larva state."

Birds that eat fruit are observed to prefer insects, and to resort to fruit only when insects are scarce or placed beyond their reach. The author of "The Journal of a Naturalist," says of the fieldfare, a bird resembling the American robin: "In this county, (Gloucestershire,) the extensive low lands of the river Severn, in open weather, are visited by prodigious flocks of these birds; but as soon as snow falls, or bad weather comes on, they leave these marshy lands, because their insect food is covered or become scarce, visit the uplands to feed on the produce of the hedges; and we see them all day long passing over our heads, in large flights, on some distant progress, in the same manner as our larks, at the commencement of the snowy season, repair to the turnip-fields of Somerset and Wiltshire. They remain about during the continuance of these causes which incited their migration; but as the frost

breaks up, and even before the thaw has actually commenced, we see a large portion of these passengers returning to their worm and insect food in the meadows, attended probably by many that did not take flight with them."

The services of the common robin, as the guardian of our fields and agricultural crops, are of such an indispensable character, and so far exceeding those of any other bird, that I feel constrained to devote a considerable portion of this essay to his defence. A few years ago, the horticulturists in the vicinity of Boston, annoyed by the depredations of the robin upon their early fruits, petitioned the legislature to strike out the name of this bird from the list of those which are protected by statute. The subject was referred to a committee, who were ordered to make inquiries and report upon it. Professor J. W. P. Jenks, chairman of this committee, has published in his report some new and important facts, that clearly establish the character of the robin as one of the farmer's friends.

The course he pursued was to kill one robin daily, and carefully examine the undigested food which it had eaten. From these daily examinations, not a particle of vegetable food was found among the alimentary contents of this bird, from the early part of March to the first of May. Insects of many species, in all stages of growth and development, were its sole food. Nine-tenths of the aliment collected during this period consisted of one kind of larva—that of the Bibio Albipennis of Say. Of this larva, from one to two hundred, in a fresh condition, were frequently taken from a single bird.

This fly, according to Dr. Fitch, comes abroad about the 20th of May, and continues a little more than two weeks. It is very common in fields of growing wheat, and probably lives at the expense of this crop. It is found, however, abundantly upon other vegetation, resting upon the leaves and flowers of the garden, and in mowing lands and pastures. It may be recognized by its frequency, its white transparent wings, and its black body, clothed with soft white hairs. The larva of this insect is very pernicious, by feeding upon the roots of plants and causing them to perish, and doing great mischief to strawberry plats, vine-borders and other places where the ground is not disturbed in spring and autumn. An English writer states that the ranunculus beds in his garden were

destroyed by the larva of one of this genus, for several years in succession.

These facts lead to the conclusion that the robin fairly earns his feast of fruits, by ridding the garden and orchard of one of their most destructive pests. The large quantities of this bibio larva which he consumes during the early spring months, explains in part a certain habit observed in the ways of robins, of scattering themselves singly over the fields and other grounds. The larva of the bibio are gregarious, living together in swarms, perforating the ground, and making it resemble a honey-comb. The parent fly deposits her whole stock of eggs in one spot, and the robin, finding this treasure, resorts to it day after day, until the whole mass is consumed.

The bibio larva was not found in the food of the robin after the middle of June, but was replaced by a variety of insects and worms; also, caterpillars, spiders and beetles of the family elateridae—the parents of the well-known wire-worms, so destructive to various kinds of seeds, when committed to the ground. The earth-worm was employed by the old birds for feeding their young, but sparingly used for its own food. In the season of cherries and strawberries, these and other pulpy fruits were found intermingled with insects in such proportions as to show that the robin never uses an exclusively frugivorous diet. He employs fruit as a *dessert*, not as a substantial meal. The mixed diet of the robin continues from the ripening of strawberries until October; the vegetable part consisting in August and September of the berries of the poke and elder. After this date, he feeds upon grasshoppers and other orthopterous insects. A few robins linger in our woods after the general migration of the species, when they are often obliged to feed upon winter-berries, especially if the snow has covered up their supply of dormant insects. These and other important facts may be found in Professor Jenk's interesting report.

I will now proceed to speak of my own experience in regard to the habits of the robin. This bird is not omnivorous; his food consists more entirely of insects than any other bird that can be named; for the other large thrushes will occasionally swallow a grain of corn, which the robin has never been known to do. He has been accused of living upon fruits alone, and by others of adding no other article to his feast of

fruits except earth-worms, which are believed to be profitable to the soil. He is often seen, after a shower, drawing a worm from its hole; but this is more frequently a cut-worm than any thing else, as I have ascertained by repeated observation. He also devours, indiscriminately, nearly all sorts of insects that crawl upon the surface of the soil, except those of a very minute species. He prefers the corneous insects for his own food, and uses worms and larva chiefly for his young that require soft food. Earth-worms are not relished by old birds, save the marsh-birds, when they can obtain orthopterous and other hard-shelled insects; poultry, though greedy consumers of earth-worms early in the season, will always reject them for grasshoppers, when they can take their choice.

A very small proportion of the insectivorous birds take their food from the ground, but confine their labors to the leaves and branches of trees, as explained in my preceding remarks on foraging. To the robin and other thrushes, the blackbirds, the grackles and the Gallinaceous birds has nature chiefly entrusted the work of ridding the surface of the ground of noxious insects. But of all species, the robin is in this respect the most useful, in our own land. He is peculiarly the guardian of the grass-field and of all our annual crops. Hence we find the number of robins in the suburbs of our cities greater than in the rural districts, because they find the most food where the soil is in the highest state of cultivation, giving birth to proportional quantities of insects. There are no other birds that could supply their place with equal advantage to these crops. The other thrushes are too shy to frequent our gardens, and blackbirds and plovers cannot be sufficiently domesticated.

It is not probable that we could raise more than half the usual produce of our fields and gardens, if the robin were exterminated. He destroys nearly all kinds of worms, grubs and caterpillars that live upon the green-sward and cultivated land, and large quantities of crickets and grasshoppers, before they are fully grown. The grubs of locusts, of harvest-flies and of beetles, and the pupae of the same, when turned up by the plough; apple-worms, when they leave the fruit and crawl about in quest of a new shelter; those subterranean caterpillars or cut-worms, that come out of the earth to seek their food;

all these and many others are eagerly devoured by the robin. Cut-worms emerge from the soil during twilight to seek their food; and the robin, one of the earliest foragers in the morning, and one of the latest in the evening, takes great quantities of cut-worms at such hours.

The number of this race of caterpillars is so great that "whole corn-fields," according to Dr. Harris, "are sometimes laid waste by them. Cabbage-plants, till they are grown to a considerable size, are very apt to be cut off and destroyed by them. Potato vines, beans, beets, and various other culinary plants, suffer in the same way. The products of our flower-gardens are not spared; asters, balsams, pinks, and many other kinds of flowers, are often shorn of their leaves and central buds, by these concealed vermin."

The robin is an indefatigable destroyer of these caterpillars, feeding his young with them almost incessantly. And when we consider that this bird always raises two broods, and often three broods of young in a season, we may judge that his demands for insect food, especially in its larva state, must exceed that of any other species. Last summer, (1861,) having been confined nearly all the season to the house by illness, I had ample opportunity to watch the habits of the few birds that could be seen from my windows. These were chiefly robins, bobolinks, grackles and other blackbirds, as well as multitudes of sparrows. Though a continual warfare was waged against the grackles, by the owners of the fields, I saw enough to convince me that they were warring against their own friends and servants. The robins were very numerous and familiar in my neighborhood (the west end of Somerville and North Cambridge.) One pair had a nest very near my house, and were rearing a second brood in the month of July, when the soil was so greatly parched by drought, that if robins lived only upon berries and earth-worms, they must have starved to death. I had often seen these birds at a distance pecking vigorously upon the sward, and then drawing out a worm. I knew that there were, at this time, no earth-worms near enough the surface to be within the reach even of the long-billed snipes. But when the bird was near enough, I could distinctly see, by the form and appendages of the creature, that it was invariably a cut-worm of a large species and of an olive

green color. The female bird was the most industrious. She would carry off one of these grubs as often as once in five minutes, whenever I watched her movements, and very often she would have two in her bill at a time. One day, close under my window, I saw her bear off three cut-worms at once, all of which were taken before my sight in a space of about a rod square. Never did I see, at any time, an earth-worm in the mouth of this bird, during this month, nor any thing else except cut-worms, of which this single pair must have destroyed an incalculable number. The old birds probably swallow all the hard insects, and save the larva exclusively for their young.

The fondness of the robin for juicy fruits, which is the cause of the complaints brought against him, is not peculiar to his species; but it is most remarkable in birds which are exclusively insectivorous. And it is well to consider that nature does not grant us a benefit without taking some compensation. We must be content to pay for the services of our useful birds, by allowing them, as a perquisite, a certain portion of the fruits of our soil. We must pay the crow and the blackbird in corn, and the robin and the cedar bird in cherries; and if it be objected that the robin-tax falls disproportionately upon the fruit-growers, so, on the other hand, the blackbird tax falls disproportionately upon the farmer and the corn-grower. These evils, except as they can be prevented by watchfulness and ingenious contrivances that do not harm the birds, must be patiently endured for the common good.

Early in May, in 1858, I caught and caged three young robins, after they were fledged, for the purpose of studying their habits of feeding. I commenced by giving them earth-worms and soaked bread. They soon died, evidently from the effects of their farinaceous diet. I then took two others from the nest, and fed them on earth-worms alone; but upon discovering, after a few days, that they were drooping, I fed them afterwards on insects combined with a small quantity of earth-worms, and they immediately revived. All kinds of insects they devoured with eagerness, and remained healthy and vigorous. I never knew them to refuse one of any description, though I offered them no insects with stings, nor any hairy caterpillars. All kinds of beetles, moths, grubs, crickets, wire-worms, crysalids and smooth caterpillars they freely

accepted. The manner in which the robin managed these insects was proof that they agreed with his instincts. They were placed upon the floor of his cage, and on picking them up, he killed them in a way that showed that he knew how they ought to be managed, as a cat knows how to seize a rat or a mouse, though she has not been instructed. He was particular in beating the wire-worm, before he swallowed it, but he never refused to eat one. On one occasion, having swallowed a hard beetle, and finding it incommodious, he threw it up by a ruminating effort, seized it again, thrapped it awhile against the floor, and then swallowed it a second time. This manœuvre proved his instinctive knowledge of the mode of proceeding in such emergencies ; and it is hardly necessary to repeat the truism, that no animal or bird can know how to manage a living thing which he is going to devour, unless it be his natural food.

It is now generally understood that the public will not consent, for the gratification of fruit-growers, to exterminate the robins ; when the people fully understand the value of grackles and blackbirds, these will also be protected ; and farmers and horticulturists must devise certain expedients to defend their crops from their depredations. The granivorous species should at certain seasons be fed with grain at the public expense ; and for the frugivorous species, cherry trees should at the public expense, be planted abundantly by the roadsides. The number of robins would not be increased by this greater abundance of fruit, because fruit is not their staple article of food ; their subsistence is dependent entirely on the supply of insects. But in proportion to the general cultivation of fruits, will the depredations of the robin and the wax-wing upon the trees of our gardens be diminished.

It is equally important, for the same end, to encourage the growth of the early wild fruits. It is in the vicinity of Boston and other large towns that the fruit-growers suffer the most damage from the birds, because the blueberry bushes which afford them a supply in the country, have been extirpated from the wild lands near the former places. Blueberry bushes should be planted extensively along the sides of fences in all fields which are used for mowing or pasture. Thousands of miles of stone-wall, in the vicinity of every large town, might

be bordered with these wild fruits, to supply the birds with a dessert and divert them from our gardens. Without occupying any valuable space, these blueberry bushes would feed the birds and produce tons of berries to employ the diligent hands of women and children of poor families, who would gather them for the market. When such provision is made by our different legislatures, or by private munificence, the birds will be satisfied and our gardens will be secure.

There need be no fear that birds will multiply beyond their means of support, as spontaneously furnished them by nature. When man makes no efforts to destroy them, birds of every species will multiply in proportion to their supply of food, on the one hand, and to their shelter and conveniences for building their nests and rearing their young, on the other. Blackbirds diminish in numbers, while robins multiply, as the country is cleared and cultivated, and the improved tillage causes an increased supply of their insect food. This is because the protection which the robin receives is denied to the blackbird. But if men are disposed to complain of the larger proportion of robins in their own vicinity, let it be remembered that the greater amount of land in high cultivation requires a proportionally greater number of these birds to devour the insects which are engendered by the more extensive cultivation of the soil; and if they are kept below this limit, the insects upon which they feed will have an insufficient check upon their over-multiplication.

It is necessary, for the interest of agriculture, that birds should be fully up to their supply of insect food; but this cannot be, on account of the numerous ways in which they are exposed to destruction; by cats, by birds of prey, by gunners, and by juvenile nest-hunters. It is the duty of legislators, therefore, to make laws for their protection; and to render these laws effective, public opinion must be enlightened with respect to the utility of birds; and the people should be made to understand that, as soon as the abundance of insects is increased disproportionally to the number of birds that feed upon them, their crops will suffer in the same proportion. Not an acre of cultivated land in the whole country should be without a pair of robins; and protection should be extended to all other birds, except the rapacious tribes.

ON THE CULTIVATION OF CRANBERRIES.

BY NATHAN PAGE, JR.

The first thing necessary for a novice in the art of cranberry-growing, if he intends to engage in that business, is to learn what has already been done by others. It is quite too expensive for a man of ordinary means to attempt a new business without first informing himself in regard to it. A wealthy man can, if he chooses, proceed ignorantly, and bear, without injury, the ill-success that he is quite likely to meet with. A poor man most certainly cannot afford such risks. He *needs* to be reasonably sure of success—not a partial, but a paying success. Most men *desire* good and profitable results from their labors, whatever their necessities may be.

One most excellent way to get information, is to visit the grounds of other cultivators. To inexperienced persons I would say: You can learn in six days' time, spent with successful cranberry-growers of different places, many important facts that it might cost you six years of experimenting to obtain. You should see the different situations in which cranberries flourish, and the various soils on which they succeed, that you may be able to judge intelligently of the value of your own grounds for cranberry-growing. You should see which, of all cultivated vines, are the most hardy and prolific. You should compare the qualities of different varieties, and learn which is best, and which would be most profitable for growing in the soil and situation at your command. But you should particularly observe the various modes of cultivation, and note the cost and the comparative success. If you would get the most valuable information on any branch of agriculture, ask it of him who has made the study and practice of that *his special business*.

It is possible to grow cranberries on almost any kind of soil. Probably there is not a farm under cultivation in all New England, on which cranberry vines cannot be made to flourish and to produce more or less fruit. But there are two kinds of soil on which it will pay to cultivate this valuable fruit. Clean, moist sand, and wet meadow or bog soils are most suitable. In Essex County there are many hundreds of acres of wet meadow

lands, that now produce only small crops of poor grass, and worthless crops of moss and weeds. Such soil is excellent for cranberries. Indeed, cranberries of many varieties, and of good quality, grow spontaneously along the borders and elsewhere on these meadows in all parts of the county. Thus, we have suitable lands; we have good vines; the crop can be profitably grown: there is no reason why we should not succeed in this comparatively new branch of agriculture.

I will note some points that may be of value to beginners. First:

Select Ground that can be Overflowed.—This is essential to the best success. On all meadow, bog or peaty soils, the vines should be covered with water, from twelve to twenty inches deep in winter. This is especially important where the vines are kept free from moss, as they should be. A more shallow depth of water is not so good, for it is liable to become frozen quite through in extreme cold weather. In that case the ice might seriously injure the vines. On some peculiar sandy soils, cranberry vines will do very well without winter flooding. But in our severe climate, they are in all cases much the better for such winter protection. There are other benefits—and very important ones—to be derived from the use of facilities for overflowing. The prevention of injury by spring frost, is one; the destruction of the cranberry worm is another. I may allude to these in another place. Another point is, to

Make the Ground Clean.—Clear off all bushes and rubbish, and take off the turf to such depth that sedge grass and weeds will not spring up from their roots and grow again. The value of this turf, when piled and rotted, or composted, as a dressing for uplands, is usually greater than the cost of clearing it off and hauling. But if it were of no value, its removal is a work that should be done before planting the vines. The surface of the ground must be made smooth, and should be nearly level. A very slight inclination towards the drains is often useful, but is not absolutely essential if the soil is sufficiently porous. If the ground is all nearly at one level, the water may be kept at just the right height to give the needed moisture to the whole field of vines. This is important, especially in dry seasons.

Draining is often required to bring meadows into a workable condition. One leading drain or open ditch, with a free outlet, is always needed in such lands.

A few side ditches, leading to the central one, are usually necessary. Sometimes an outside drain is wanted along the borders of the meadow, to cut off the flow of water from the higher lands around. Very cold water should be kept from the vines in summer and autumn. It is injurious to the vines, and retards the growth and the ripening of the fruit. If a dam is built to overflow the ground in winter, the outlet through it, at the end of the principal drain, should be made low enough to take off the water to the bottom of that drain, or to the depth of thirty inches or more from the surface.

Apertures made through the gate at various heights may be opened or closed so as to completely control the depth, or rather height, of water in the drains. This ability to regulate the flow of water, will often make the difference between a large crop of nice fruit, and a small and every way inferior crop.

Wherever it is possible cover the Ground with Sand.—Clean, coarse sand is best. If the soil is covered only two inches in depth with sand, if will be of great service; but three or four inches deep would be still better. A thick layer of sand will keep down most kinds of weeds, and prevent grass from growing among the vines. Some men have made cranberry culture profitable, where it required the constant labor of one man three or four months of the warm season to keep half an acre of vines clear of weeds; but it is far better to spend a month or two to prevent weeds from growing. Cranberries have been sold at such high prices for a few years past that almost every method of culture has been profitable. Even the worst modes have paid fair dividends on the cost; but the best alone are to be recommended. Skilful culture may yet make cranberry-growing profitable, even if the fruit should sell for something less than one dollar per bushel. Where no sand can be obtained, *gravel* may be spread on the meadow after the turf has been removed. The less loam the gravel contains the better. It should not be spread on in very great quantities, for it is not so suitable as sand for the vines to grow in. A thin layer of about an inch is, in some cases, better than more.

The best time to set the Vines is Spring.—Cultivators who have vines always at hand on their own grounds frequently plant them out when it is most convenient, either in May and June, or September, October and November. If set in autumn,

which in many cases is most convenient, the earlier it is done the better. Vines that are set in September become well established before winter, and will throw out most vigorous runners the next season. The vines should be selected in autumn, while the fruit is on them. You may be certain, then, of getting only fruitful vines. It is said that vines taken up in autumn, and kept in a cellar till spring, have been planted with good success. Cool and moist is the rule for keeping them. But it is much less trouble, usually, and a much better way, to take up the vines near the time of setting.

Planting the Vines.—When plenty of vines are to be had near by, and growing in a clean soil, masses of roots and earth, six inches in width and one foot in length, may be taken up and set in rows two feet apart and at eighteen inches distance, from sod to sod, in the rows. Some prefer setting narrow strips, or cuttings of cranberry sod, quite close together, and in rows about fifteen inches apart. Sods containing grass, weeds or moss should never be planted on grounds that are to be cultivated. The vine roots in such sods must be separated, and, after the grass is removed, they may be set from six to ten inches apart, along drills eighteen inches apart. This is the most common mode, and the most suitable under various circumstances. Slips of vines or cuttings, three or four inches long, are sometimes used instead of rooted plants. These may be set closely in drills, and sloping in one direction along the row, the lower ends being covered about an inch deep, or more if the soil is not quite moist. It is said that cuttings, five or six inches long, if bent downwards in the middle and covered an inch deep with soil, will root quickly and send shoots from each end. The method is worth trying. Cranberry vines take root so readily in favorable soils, that, if sown broadcast, and tramped or harrowed in, they will grow pretty well. But such methods cannot be recommended where the best culture is to be given.

Hoeing and Weeding must be attended to, if the ground requires it. These are difficult operations after the runners spread over the surface and take root. They should be disturbed as little as may be consistent with clean culture. A man who has weeded cranberry vines two or three seasons, will understand the importance of taking off a few inches of the top

soil of meadows, and covering the surface with sand before setting cuttings or plants.

Gathering the Fruit.—Cranberries should be well ripened before being gathered. If picked before they are fully grown, they are bitter. The same fruit that is inferior, bitter, and nearly worthless when taken off too green, would be excellent if fully ripened on the vines. Unripe berries, if spread in thin layers on shelves, or on the floor of a room, become well colored by exposure to light; but the ripe appearance does not make the quality good.

Severe frost injures unripe cranberries. This causes some to gather them too early. Perhaps the fruit might be protected, if necessary, a few frosty nights in September, in the same way that the blossoms are, sometimes, in spring. Three or four small piles of turf, or brushwood and peat, placed around the border of the meadow, are set on fire in the evening when there is danger of frost. These fires are left to smoulder all night. The smoke settling over the surface of the meadow, is sufficient protection in quite cold nights. Three or four fires, if properly arranged, will often protect two acres of vines or more.

The cranberry-rake is much used in gathering the fruit on wild meadows. On cultivated grounds, hand-picking is much the best. The fruit so picked is all clean and nice, and unmixed with bruised or worthless berries. The rake injures thickly grown vines exceedingly. It is necessary, after using the rake, to go over the ground again and pick by hand considerable fruit that it leaves among the vines. To pick wholly by hand, costs about fifty cents per bushel, usually, but sometimes a little less. The nicer the fruit is grown, the more important it is to pick by hand.

Keeping.—Cranberries, if well ripened and properly gathered and assorted, can be kept as easily as winter apples, and for a much longer time. Some persons put them in barrels, soon after being gathered, and place them in a cool and airy situation at the north side of a building. They are left piled up there till quite late in the season; but when in danger of freezing, they are taken within doors. During winter they are kept in the cellar.

Small quantities may be spread on shelves, or floors of airy unused rooms. They may thus be kept nice till time to put

them in barrels and remove to the cellar. Cranberries are often put into clean kegs or casks, which are afterwards filled with pure cold water, and made tight, and are then sent safely through all climates, to the most distant markets. When the fruit is raked from the vines, it may be kept for a time in the chaff, and be winnowed and sorted late in the season, or at the time of disposal.

Selling the Fruit.—This is an important part of the business. Very often, the whole difference between very great and very small profits, is the result of greater or less skill in selling. It is useless, perhaps, to undertake to give directions in this, for success consists principally in mere tact and ability to judge of the proper time, place and mode of disposal. I will venture a few hints, however.

A man who grows nice cranberries and ripens them well, and who invariably puts them up well assorted and clean, can easily obtain from fifty cents to one dollar and twenty-five cents per bushel more than one who is careless on these points. So, too, a man who informs himself which are the best markets, will find the best customers there, and so obtain better prices.

Many cranberry growers are at present rather too much at the mercy of shrewd cranberry dealers in Boston and elsewhere. These buy up the crop in the fall, at their own prices, and ship them off to various ports later in the season, making enormous profits by the transfer. This may be borne, for in time more of the fruit will be grown, and prices will become more equal as the markets will be more numerous, and much more generally known. But there is one imposition that should never be submitted to. It is that of selling to dealers, as some of them demand, five pecks for a bushel. Four pecks of cranberries, *level measure*, are one bushel. It is by this measure that the dealers themselves sell them, except when charging an extra price for heaped measure—which is *not* the legal one.

Cranberry growers would do well to find a market for a large portion of their fruit in Europe. If they would take the trouble to find customers there, and would put up the fruit properly, and ship it directly to them soon after being gathered, it would be far more profitable than to let it pass through a dozen hands, as some of it does now. A more extensive introduction of our

unrivalled American cranberry into France, England, and other countries, would soon give a great and unfailing demand.

The English already pay high prices for a scant supply of this luxury. Only a few can use them freely yet; but with a better supply of the finest berries, at reasonable prices, they would be more extensively called for each coming year. One cranberry grower in the north part of our county told me lately that he would pay half the expense of sending an agent to England, to obtain information in regard to their markets, and make arrangements for the disposal of cranberry crops to be sent directly from the producers.

Time for Overflowing the Grounds.—This is usually done soon after cleaning the vines, or about the last of October in this climate. The water should remain on all winter, of sufficient depth to prevent its becoming frozen through to the ground. It should be drawn off, just down to the tops of the vines, early in May, or as soon as the weather has become mild. The vines will then receive some benefit of sunlight and warmth, and the water will still prevent injury by frost. The crop is often greatly damaged, and occasionally almost wholly cut off by late spring frosts, where water is not kept among the vines to protect them, and prevent them from blossoming too early. In June, after all danger of frost is past, the water must be drawn off entirely. If the water is not too cold, it will be of great benefit to raise it, in the dry season, so as to give moisture to the roots of the vines.

Overflowing in winter prevents, in a great degree, the attacks of the cranberry worm—that pest which sometimes destroys a large portion of the fruit. Mr. A. H. Leland, of Sherburne, stated, in 1853, that he completely exterminated the vine worm, the year previous, on vines that had been "yearly eaten up by them since 1840," by keeping the vines under water from "spring till the first of July."

It may be well for me to add some notes on the varieties of cranberries which are most extensively grown. They are all of one species—the American, or *Oxycoccus Macrocarpus*. Only one other species is known, I think, in this country; and that is a small upland cranberry, the *Oxycoccus Palustris*. It is said to be of good quality, and it grows only on dry, poor soil. It has not yet been tested by cultivation, but it is not probable

that its culture can be made profitable here. Some persons may, however, be disposed to try it, as the upland culture of our American species is nearly played out.

There is a shrub (species of *Viburnum*) that bears pretty clusters of small, bright red berries, having a pleasant acid flavor, or taste, and which are called "bush" or "tree cranberries,"—but they are no more cranberries than choke-cherries are gooseberries.

Of the varieties cultivated here, the large dark crimson berry is considered one of the best—perhaps it is the very best. Its quality is excellent. It ripens early. In color it is much richer than others, and its very handsome form and appearance adds something to its market value. Its size is large when well grown. It can easily be made to attain the size of three-fourths of an inch in diameter each way. Both on clean meadow and on moss, I have seen it this season, averaging about that size, with many berries considerably larger.

The largest cranberries that have been grown in quantity, in Essex County, are of an egg-shaped variety. I do not know whether or not it belongs to the Bugle class. It certainly does not resemble either the Cherry or the Bell class, in form. Mr. Hildreth, of Manchester, cultivates this sort with most enviable success. A large portion of his berries, of this kind, grown this season, measured three-fourths of an inch in diameter one way, by one inch the other. Some were larger. The fruit is much lighter in color than the Cherry variety, and, I think, a little later in ripening. It takes a lively hue late in the season, but does not become dark crimson, like the Cherry. It is of excellent quality, and commands a high price in market. The vines of both these varieties are very prolific.

The Bell cranberry is a good variety, or rather, class, and with the best culture the berries grow quite large. I have seen single specimens of this kind measuring seven-eighths of an inch broad near the blossom end, the diameter the other way being a trifle less. It is a valuable and profitable kind, and is extensively cultivated in Barnstable County, on the Cape. I speak of the Bell cranberry as a class, because there are many varieties that, merely from their form, pass under that name. They have properties well nigh as distinct from each other as so many seedling apples. The same is true of the Cherry and

the Bugle classes. With our little knowledge of cranberries, we speak of them, usually, as we sometimes do of strawberries, as Scarlets, Woods, or Pines. But these are only general terms, and we have learned that every Scarlet is not an Early Virginia, nor every Pine a Moyamensing. We shall yet learn as much of cranberries.

Improved Varieties.—Some effort is usually made, in planting vines, to select the best; but I have never seen, in our country, a large bed entirely of one, or two, or even three varieties. If every person engaged in cranberry growing would select, each year, a single plant of the most prolific kind, or one bearing the finest berries, and set it apart from others, propagating from runners only, the best sorts might be tested thoroughly. Then let the various growers compare notes yearly, give the very best sorts each a name and a character to start in the world with, and very great improvement must be the result.

But there is still another field of operations;—it is to raise new varieties from seed. It is not necessary to say much on this point. It is something that can be done, and will be done, until substantial advance is made in this as in other fruit and other agricultural productions. But pray, Messrs. Cultivators, pery don't impose upon each other, and the more ignorant public, by sending out inferior varieties as worthy of attention. Don't propagate shams. Don't give fictitious characters to any sort, whether good, bad, or indifferent. One who don't fear the outward disgrace of deceiving others and selling humbugs, should still dread to feel the littleness of a mean soul within. Few farmers may need such words—I hope none. Look to the seedlings, then, for time and attention and skill shall make improvements in these, as they have in currants and gooseberries, blackberries, raspberries and strawberries. Room, room, then, for extra nice varieties of cranberries—the Brighton Pines, Hovey's Seedlings, and Scarlet Magnates of the swamps and meadows.

The marshes and bogs of Essex may yet glow with scarlet and crimson fruit far superior to any that can be gathered from them to-day.

But one thing more I desire to allude to. It is, the importance of adding one more to the staple productions of our

county. Some branches of agricultural industry have become less profitable than they were years ago. In grain growing, we cannot compete with the West, even in our own home markets. Neither can we in stock raising. Even dairying is mostly out of our hands. In regard to wool growing, I regret to say that we keep many more dogs than sheep. Even growing vegetables for our city markets is now only profitable to those who live near them. Several other branches of the business are too much crowded. Some labor, then, can well be spared for the production of another crop. To farmers in some situations, cranberry growing would be a far more profitable business than any other they could follow. But if it were only equally profitable, it must still be advantageous to pursue it.

The more varied our branches of successful industry may be, the more self-reliant we are, and the more independent of fluctuations in business, and even of national changes, we become. The theme is exhaustless, and I will not pursue it farther. Yankee shrewdness and enterprise now buys cargoes of foreign productions with the mere frozen water of our frigid winter clime—Yankee intelligence and industry may yet sell fine summer productions of marsh water and sunlight for many pounds of foreign silver and gold. May the pioneers reap their proper reward.

PLYMOUTH.

PRESERVATION OF APPLES AND OTHER WINTER FRUITS.

BY AUSTIN J. ROBERTS.

This subject demands much attention, and, properly speaking, it is one of the chief branches of fruit culture. It is important that every one who cultivates or buys fruit should know all the minutiæ of the gathering, ripening, and preservatory processes, each one of which is an art in itself. Nature gives us the choicest fruits, which man too often destroys, for the want of knowing how to take care of them. I have heard it remarked

by many persons, that their fruit, particularly apples, did not keep well, and the fact was attributed wholly to the increase of insects, and to other causes, rather than to the generally slovenly, careless manner in which fruit is often taken care of. Even the time when apples, pears, and fruit in general is gathered will be found, not only to have something to do with their keeping properties, but also with the flavor and quality.

All winter varieties should be allowed to remain on the trees as late as safety will permit; by thus doing they lose much of the water contained in their juices, which become more sugary, high flavored, and better elaborated.

This treatment refers only to winter fruit. The method of management with summer apples, as well as summer and fall varieties of pears, is wholly different. They should be picked early, as soon as the skin begins to change color; otherwise they become mealy and almost worthless. Some pears are of third quality when allowed to remain and soften on the tree, but become rich, melting, and delicious if house-ripened.

The manner of gathering should always be by the hand. It is of great consequence in gathering all kinds of fruit to avoid bruising. The branch to be gathered from should be taken by one hand, and the fruit carefully picked off by the other, with the stems attached. Fruit never keeps as well without the stem. It is always well to have a doubled piece of paper, or a little moss at the bottom of the baskets used for picking, to prevent chafing, and a bent piece of iron or strong wire, in form of an S, is convenient to hang the basket to the rounds of the ladder, or the branches of the tree.

Peaches and other soft fruits should be pressed as lightly as possible in gathering, for any thing like a squeeze is certainly followed by decay, in the form of a brown spot; and thus it is that peaches brought into our markets decay so soon. Many careful cultivators, when more than one layer of fruit is laid in the same basket, put a little cut hay to separate them; for it is very difficult to place one layer immediately upon another, and especially if the fruit is approaching maturity, without more or less bruising. One point more, that I would lay much stress upon, that is, all fruit, for long keeping, should only be gathered in dry weather and on a bright sunny day.

The mode of gathering and packing apples for exportation, as practiced by R. L. Pell, of Ulster County, N. Y., who obtains nine or ten dollars per barrel for his Newtown Pippins in the English markets, will serve as a model for the care taken to prevent bruising: "In autumn, when the apple harvest commences, men are employed, each with a hand basket, and hook to attach the basket to the limb of a tree, and a step ladder. The apples are picked one at a time, and laid into the basket. When the basket is full, the man comes down from the tree and takes two apples at a time, and places them in two-bushel baskets. When there are enough large baskets filled for a load, they are lifted by two men on a sled and drawn by oxen to a large building, where they are taken from the sled and put on the floor, two apples at a time. They are piled up eighteen or twenty inches high, where they remain three weeks. At the end of this time, the apples having become dry, they are taken two at a time and packed in new barrels, the size and kind of those used for flour. The barrels being headed up, are lifted on a sled and drawn to the North River; they are then carried by men on board a steam-boat, and taken to New York. When shipped on board a vessel for London, the barrels are hoisted one at a time from the steam-boat, and when lowered on board the vessel are caught on a man's shoulder, and then taken by two men and placed in the coolest part of the vessel. Upon the arrival of the vessel in London, the barrels are hoisted from the vessel and lowered on a hand-barrow, and then carried to the warehouse, in the same manner that we carry a looking-glass."

It is seen by the foregoing precautions that the apples are never *shaken*, *jolted*, or *jarred*, and they arrive in London in far better order than apples usually taken to our city markets. Mr. Pell further states, "that apples for shipping have sometimes been packed in dry sand, charcoal dust—and at other times, they have been separately wrapped up in paper, in the same manner as oranges are shipped; but they can be shipped with as much success without any thing with them, if only managed with care in other respects."

Mr. Pell's success in the culture of his immense orchards—some twenty-five thousand apple trees—is well known, and the method and skill with which he packs his apples are so well

appreciated in the London market, that his crop is anticipated before hand, at the highest rates.

The apple worm, or coddling-moth, (Carpocapas pomanella) which is so prevalent in Massachusetts, and especially destructive to fruit in the light soils of Plymouth County, is what the orchardist must contend against in order to have his winter fruit sound and in good condition for keeping. The damage done to apples every year by the apple worm is immense. Many of the apples after they are punctured, fall from the trees before they are half grown, and those that remain on till fall, on account of the punctures of the worms, will not keep more than three weeks after they are picked.

In about the latter part of June, or during the first or second weeks of July, the millers or moths fly about the apple trees at night, and deposit their eggs in the calyx or eye of the apple, and sometimes in summer pears, preferring early to late fruits; the eggs hatch in a few days, and the young worms burrow in the apple, making their way gradually to the core. In three or four weeks they come to their full size, and feast on the heart of the apple until it falls, when they soon after make their escape at the opening that has been used for the ejection of their excrements. On leaving the apples, the worms crawl into the chinks in the bark of trees or other sheltered places, which they hollow out with their teeth. Each here spins a cocoon, or silk-like case, like white tissue paper. When the weather is favorable, these worms change to chrysalids, and, turning into moths, come forth the same season a new and second generation of destructive agents. I would suggest a remedy which I think will perhaps be as efficacious as any that can be adopted, and which I shall use more extensively in my apple orchards in future. In the first place, I prepare a poisonous mixture of the following. One pint of vinegar, one gill of honey, and one ounce of cobalt. Cheap, deep tin plates —rather deeper than common soup plates, but of the same size —are used to put the composition in. These holes, equidistant from each other, are punctured on the outer edges of the plates through which are passed strings of stout rope yarn, each about eighteen inches long; these are brought together at the end and fastened to one of the lower branches of the apple tree, thus leaving the plate containing the sweet, poisonous prepara-

tion pendent to the branch; taking care that the limb be a stout one, so that there should be as little sway by the wind as possible. There should be a dish to at least every sixth apple tree in the orchard, and one to every other tree would be better. The depth of the mixture should not exceed half an inch, and to be replenished as often as is needed during the moth season.

By this method, I am confident that thousands upon thousands of the apple moth and the apple and peach borer flies may be destroyed. Honey and vinegar is very attractive to the miller family, and any moth tasting it will be at once killed by the cobalt before it can deposit its eggs.

The French take more pains in the preservation of their winter fruit than either the English or Americans; they are nicer in the various details of management than we are; they export more pears of the winter sorts than any other people. For some years past, some of the chief fruit dealers in New York have imported their best winter pears from France; they arrive usually in the finest condition, being packed in small boxes, which are easily handled; the bottoms and sides are covered with very dry moss or soft paper, well calculated to absorb moisture. Each fruit is then wrapped in dry, soft paper, and laid in layers, the largest and least mature at the bottom, and all the interstices filled with dry moss. These boxes are so tightly packed that not the slightest movement can take place. The dry moss separates each fruit, absorbing any moisture; and if one decays it does not affect others.

One of the first requisites in keeping fruit in good condition is an *even temperature* above frost; this seems to be indispensable. To this end a fruit room should be set apart exclusively for the preservation of fruit; and, besides an immunity from moisture or dampness, there should be exclusion from light.

A good dry, cool cellar is as good a place for keeping fruit in as can be provided; but it should be remembered that no winter fruit should be stored away in the cellar, as long as it can be kept elsewhere without danger of frost. A dry outhouse is a very suitable place. Immediately after gathering apples, they ought to be placed in such a building, in heaps two or three feet deep, to undergo the sweating process.

When the time comes to put them in the cellar, they should be well dried on a sunny day, and nice clean barrels having been prepared, by boring a number of half inch holes through the bottom, sides, and the head of the barrel, for ventilation, the apples then, two by two, should be carefully laid in, and the barrels filled up till the top will just go on.

One of the most successful raisers of fine fruit informs me of his process of preserving his apples. In the first place, his cellar is prepared as follows: A stone wall partition is made near one side. The smaller division of the cellar thus made is used for storing potatoes and other vegetables requiring a warmer situation. The other part is called the "apple cellar." This is covered on the bottom with a hard, dry cement; and several swinging windows are provided, to admit air and give free ventilation. All around the walls, shelves or shallow bins are erected, one above another, and several tiers stand in the middle of the room. The wall shelves are three feet wide, so that one can stand in front of them and reach to the wall. The middle shelves are double this width, as they can be approached on both sides. Upon these shelves the apples are spread out as thinly as the extent of shelf-room and the amount of apples will allow. Usually the apples lie only two or three deep. The bottoms of the shelves are made of narrow boards, with half an inch space between them to allow a free circulation of air. Great care is taken to regulate the opening of the windows—which are of double glass—so as to keep the air very nearly down to the freezing point. Usually one or more of the windows are left open, or partly open, night and day. In the coldest weather they are closed at night and opened every fair day.

In this way carefully gathered apples are kept all winter with very little loss. The shelf arrangement renders it a very easy matter to look over the fruit, which is done every few weeks, when, any of the fruit commencing to decay, it is at once removed from the room.

Such a cellar costs but little, and, as in the instance alluded to, it pays well. Where a family has but few apples, and wishes to preserve a barrel or two in complete order, the best way is to procure a sufficiency of sand, and dry it well by setting it in kettles on a hot stove, or in a cauldron, till all the

moisture is driven out, then let it get entirely cold, and use it to pack down the apples in the barrel. The sand absorbs all excess of moisture, and preserves an uniform temperature. By this method all kinds of apples will keep several months beyond the usual time. Charcoal, ground fine, may be used; but sand is by far the best and neatest. If used without thorough drying, it will be injurious, as, instead of absorbing moisture from the fruit, it will impart dampness, and decay will at once commence. Winter pears may be preserved in the same way, though I prefer a bureau or chest of drawers, set apart for the purpose and kept in a cool room. I cover the bottoms of the drawers with thick layers of cotton batting, on which I place the pears. Between each layer of pears a layer of cotton is used, though seldom more than two layers of pears are put in each drawer. Over them all, a double covering of batting is placed. Pears are preserved by this means better than by any other that I know of. The cotton preserves a medium temperature; and, though kept in a cool room, they never freeze.

A week or ten days before the pears are to be used I remove them to a warmer temperature; at about sixty or seventy degrees. Some varieties, as the Vicar of Winkfield, require much attention; others require but slight attention. The transfer from a cool to a warm temperature is of great importance to pears, and will convert tough, hard specimens into those which are delicious and melting.

I have known the Beurré Diel exhibited January 7th, at the Massachusetts Horticultural Society's rooms, in an excellent state of preservation, managed in much the same way as above described.

The science of ripening and preserving fruits is in its infancy, and horticultural and agricultural societies would do a great public service by offering liberal premiums that will incite to experiment on the subject.

FARMS.

PLYMOUTH.

Report of the Committee.

The committee are not fortunate enough to be able to congratulate the society on an increased interest in the competition for the very liberal premium offered for the best improved farm in the county. No others have been added to the two already entered for that purpose.

There seems to be a general impression among the farmers of the county, that to keep an exact account of the receipts and expenditures on their farms, for a whole year, is a labor entirely too onerous to be performed. Now, if this account were productive of no other good than the gratification of those who have curiosity enough to read agricultural reports, this unwillingness would not be surprising; but when it is considered that no complicated business can be successful without a minute record of transactions, it is no wonder that accurate business men are astonished at the negligence of farmers. Through the length and breadth of our county, with the exception of a few men who are competing for the society's premiums for special crops, no cultivators of the soil are to found who know what it costs them to produce a bushel of corn, to raise a calf, or to make a ton of hay. It seems to be sufficient for them, that, after thirty or forty years of hard labor, they know they have lived; but whether this has been accomplished by farming, teaming, or chopping wood, is a matter of indifference. Such a practice in commerce would be its ruin; if manufacturers imitated farmers in this respect, all mechanical employment would cease; farming alone can survive under such treatment.

If every farmer opened an account with every crop he planted, in a very short time he could determine with certainty which crops he could produce at a profit. It is not enough, to grow a hundred bushels of corn to the acre, if this corn costs two dollars a bushel to produce it. So large a crop is not wholly dependent on the extent of the farmer's wit, but rather of his purse; if he

can afford to apply manure enough, and can hoe his corn every morning, his hundred bushels are sure. This, however, does not teach his poor neighbor how he may make a living by raising corn; on the contrary, it is only a gratification to private vanity, and of no public use. It is still a matter of doubt with many, whether it is profitable, as a general rule, to raise more than forty bushels of corn to the acre; but this doubt would not have existed, if a large number of farmers, in various parts of the county, had been in the habit of keeping accurate accounts of their business. So important does this matter of accounts appear, that the committee are of opinion that due attention to this subject would necessarily bring all other practicable improvements in its train.

The most important result of the competition for the premium on farms, is the duty which it imposes of making exact returns of the products of the year, with their cost and market value; with the expenses, however, of the whole farm only, and not those of each crop. Yet, even this general attention to the accounts of the farm will induce habits of thought that will render the farmer dissatisfied until he knows the exact cost of every thing he produces; and knowing this, he will reject that which is unprofitable, and devote himself exclusively to that department of agriculture which exactly suits him and his circumstances.

The two farms offered for premium have been visited twice by the committee during the present season, and they are happy to be able to say that all the progress is being made that could reasonably be expected under the circumstances. They are well aware that no very remarkable results are to be looked for. The farms are just such as are to be seen all over our county; the improvements are just such as are within the means of almost all. On this account, perhaps, are these two cases of competition the more interesting, as other farmers will not be discouraged from making similar efforts.

CHARLES BURTON, *Chairman.*

Statement of Ephraim B. Thompson.

The present year I have cultivated as follows:—

One and one-half acres rye, eighteen bushels, one and one-half tons straw.

Two acres oats, twenty bushels, injured by the drought.

Three acres of corn, on a light and gravelly soil, were planted to corn six years ago. Since then it has been used for a sheep pasture. For thirty years past, when planted with corn, the manure has been applied in the hill. From the whole lot, on an average, when planted, it has produced fifty-five or sixty bushels.

The first of May last ploughed in twenty loads per acre of coarse manure, from the barn cellar, seven inches deep. Planted 16th and 17th of May, rows three feet each way, with a tablespoonful of Coe's super-phosphate of lime in the hill, covering the lime about half an inch with earth, before dropping the corn. Many of the hills showed that the corn was too directly in contact with the lime, from the sickly, yellow appearance, for some time after it came up. In order to test the value of the lime, as a fertilizer, on a given number of rows, I planted without any thing in the hill, and on the same number of rows I used poudrette (the same amount, in value, of the lime) half a gill per hill, dropping the corn directly upon it. Through the season the corn had a very healthy appearance, was more forward than any in the field. When harvested the result was, that where the poudrette was used, I had at the rate of sixty bushels per acre; the super-phosphate, fifty-two bushels; where no manure was put in the hill, fifty-two bushels.

I am of the opinion that pasturing sheep on the lot added greatly to the crop of corn.

About the 20th of September cut the entire lot of corn, and stooked it. The third week in October harvested, in good order, one hundred and twenty-five bushels on the whole three acres.

Potatoes, half an acre, had sixty bushels. Of five varieties planted, we had the greatest yield from the Davis seedlings.

Ruta-bagas, sixty rods, planted June 20th. It was so very dry, immediately after planting, the seed did not all come up. Nearly one-fourth of the lot was vacant. Harvested two hundred bushels; some were very large, weighing nearly twenty pounds.

I also planted twenty-four rods to carrots; for some cause but a very few came up. At the last hoeing sowed the purple-top English turnip. From the lot gathered fifteen bushels carrots, and seventy-five bushels turnips.

English hay, ten acres mowed, had eighteen tons.

Fresh hay, fourteen acres mowed, had ten tons.

By referring to last year's report you will perceive that I have doubled my crop of English hay the present year, which shows the superiority of low ground, when it is properly subdued and drained, over high land, for raising grass.

For three years past I have used Ketchum's one-horse mower, and it has worked satisfactorily.

In the month of September I carted two hundred and ten loads of gravel and sand on an acre of low swampy ground. The stumps had previously been removed, the surface was levelled, the sand evenly spread, and seeded to Timothy and redtop.

The manure, collected in the barn cellar since planting, has been carted out and mixed with equal parts of soil and loam, to remain in a heap, to be applied as a top-dressing for grass another season.

The present autumn I have set three-eighths of an acre with cranberry vines, in rows, twenty-four by sixteen inches, six or eight vines to a hill. The land was first levelled and covered with sand. The lot is on a small spring brook, with a dam, so that the vines will be flowed in the winter, and at any time when there is danger of a frost.

PRODUCTS OF THE FARM.

125	bushels corn,	$100 00
18	" rye,	18 00
20	" oats,	6 00
60	" potatoes,	20 00
4	" beans,	8 00
275	" turnips,	70 00
15	" carrots,	6 00
150	" apples,	60 00
18	tons English hay,	288 00
10	" fresh hay,	90 00
	Beef and pork, fatted,	50 00
170	lbs. butter,	34 00
230	" cheese,	24 00
	Calves sold,	18 00
	Lambs and wool,	70 00
		$862 00

EXPENSES.

Interest improved land, including buildings and stock,	$178 00	
Taxes on the above,	20 00	
Labor,	208 00	
Two tons salt hay,	20 00	
Manure applied,	100 00	
Grass seed,	5 00	
Keeping cows and sheep one year,	160 00	
		$691 00
		$171 00

HALIFAX, November 14, 1861.

Statement of Orlando H. Shaw.

In the management of my farm, during the year that is to-day brought to a close, my object has been, not to get the greatest yield that could possibly be obtained, but so to increase its fertility, and otherwise improve it, as to render it capable of yielding paying crops in the future.

The labor on the farm, this year, has been performed by myself, and a boy fourteen years of age, our whole time being devoted to it. The team work needed, such as ploughing and drawing stone, that could not be done with a horse, and a few days' assistance blasting rocks, was obtained by "changing works."

The products of the farm, for the year, are as follows:—

One acre, planted to corn; three-fourths of it was on the "lot" from which I have been removing rocks for the last two years, and was, last year, planted to corn, in drills, for "soiling." On this lot, (it having previously been ploughed,) I spread sixty horse-wagon loads of manure from the barn cellar, (a compost of horse, hogs, and cow manure, with muck,) and ploughed it in, five inches deep. Furrowed it for planting, three and one-half by three feet apart, and put ten loads of the same kind of manure in the hills.

On the 13th day of May it was planted with a "small, short-eared, eight-rowed, yellow variety," (a kind much liked by farmers in this vicinity, who are satisfied with from twenty to thirty bushels to the acre,) and came up remarkably well. I

did not find, at "weeding," one hill with less than two blades in it, while many of my neighbors were obliged to replant large portions of theirs.

The day before "weeding" I scattered a handful of unleached ashes around each hill, and at the second hoeing gave it another dressing of ashes. It was hoed three times, the stalks cut in September, as is our custom, and the corn harvested on the 10th of October. The yield was sixty-one bushel-baskets full of good sound corn, and four of "pig-corn." I estimate two bushels of ears as equal to one of shelled corn, which, counting the "pig corn," makes thirty-two and one-half bushels of corn on three-quarters of an acre.

The other quarter of an acre was planted on the lightest land I have. It was in potatoes last year, and yielded hardly enough for seed.

On this lot I spread fifteen loads of manure, and ploughed in as shallow as possible. Furrowed it three and one-half by four feet; put five loads of manure in the hill, and planted, on the 20th of May, with the "twelve-rowed New Hampshire yellow," from seed raised by Hon. Simon Brown, of Concord.

This piece also received two dressings of ashes, was hoed three times, and harvested on the 2d day of October. The yield was twenty-one baskets of sound corn, and one and one-half of "pig corn." This was, you perceive, planted seven days later, on poorer land, if such a thing were possible; harvested eight days earlier, and was more fully ripe *when* harvested than the other.

My preference, *now*, is for the "New Hampshire twelve-rowed yellow," believing that, with it, we may, almost to a certainty, escape the "frosts" at either end of the season.

On one-fourth of an acre of high light pasture land, with ten loads of manure spread and "harrowed in," with plaster and ashes in the hill, I raised twenty-eight bushels of potatoes.

On a piece of land, containing one hundred and fifty-two rods, that had been in corn two years, I sowed, on the 25th of May, two bushels of barley. One corner of the field (about fifteen rods) was so wet that the seed did not come up. It was cut the first week in August, yielding twenty-one bushels of grain, and, by estimate, one-half ton of straw.

On three and one-half acres of land, the same in grass last year, I have cut, by estimate, five and one-half tons of English hay. The yield of the same land last year, was estimated to be two tons. I can attribute the increase to no other cause than manure, most of the land having received a "top-dressing" last April.

I shall, this fall, haul out and spread all the manure now in my cellar, believing it to be the most profitable manner in which it can be applied.

The first week in August I ploughed in the barley stubble, and turned under the sward in the same field, and laid it down to grass, sowing Timothy and fine top. The seed took remarkably well, and, as the season has been favorable, it now presents a fine appearance, and bids fair to yield a good crop next year. Being hurried with my work at the time of sowing the seed, it was laid down without manure; but as soon as the ground freezes, so that the team will not "cut up" the land, I shall give it "a top-dressing."

Our time, not occupied with the care and attention of crops and stock, has been devoted to improving and repairing buildings, walls, fences, &c., or, rather, in advancing improvements already began.

The alterations in and about the barn and outbuildings, in order to increase facilities for compounding and composting,—the removal of division walls that seemed not only entirely useless, but occupied much space with their wide foundations and unsightly "hedgerows,"—clearing land from rocks and stones, by sinking and blasting, that had obstructed the free use of plough and scythe, so long as ploughs and scythes have been in use,—planting apple and pear trees, strawberry and grape vines, hoping, in due season, to reap the fruits thereof,—moving bushes, and otherwise clearing up pastures, that cattle might be enabled, with less travel and fatigue, to obtain their scanty subsistence,—gravelling and preparing for the reception of seed half an acre of worthless "bog,"—these, and works of like character, have kept us steadily employed throughout the season, early and late. Whether our time has been "judiciously" employed, and our efforts well directed, remains for you to decide. My receipts and expenses for the year ending November 15, 1861, are as follows:—

RECEIPTS.

Account of stock on hand, November 15, 1861:	
One horse,	$50 00
Two cows,	50 00
One hog,	20 50
Five tons English hay,	80 00
Sixty bushels corn,	48 00
Eighteen bushels barley,	14 40
Straw and corn-fodder,	15 00
Received for beef, calves, pork, pigs, and butter,	141 33
	$419 23

EXPENDITURES.

Account of stock on hand, November, 1860:		
Horse, cows, and hogs,	$169 00	
Hay, fodder, and grain,	70 00	
Paid for hay and grain,	86 00	
for blacksmith's and mason's work,	11 00	
		336 00
		$83 23

North Middleboro', November 15, 1861.

Supplement to Report on Farms.

Of all the professions by which men earn a livelihood, that of tilling the soil, under favorable circumstances, seems to offer most opportunities for various knowledge of nature, and for a sound development of intellect and heart. The farmer constantly lives in the presence of that beneficent power which, silently and unseen, works all the wonders of creation and change, ever retiring before the steps of the advancing observer, and luring him on to greater depths and profounder mysteries. He goes to his work at dawn, and witnesses the wakening of all life, feels its intensity during the day, and at night sees it sink calmly to repose. He is called upon oftener than other men to observe the growth of tree and flower. For the results of his labor, he is dependent upon the influence of sunshine, dew, rain, and storm; hence he must be an intent observer of every change. Apart from the excitement of crowds, his life may seem monotonous; truly so it cannot be, for he is always surrounded by the activities of nature, the best stimulant of thought

and genial companionship. From the simplicity of his intercourse, his manners are simple. As his own head and hands supply nearly all his wants, he is unostentatiously self-reliant. A consciousness of his independence and of the important functions which he performs in society makes him a man of plain dignity. These are the characteristics of a true New England farmer, who, having commenced life with that intelligence which our public schools can give, has remained true to his profession.

There is a very frequent complaint among farmers, that their sons get dissatisfied with their business, and leave it as soon as possible, deserting the certain independence of farming for the lotteries of trade. In my journeys through our county, and visits to various farms, I have often thought that this tendency might be accounted for, in part, without supposing it was due mainly to the unattractiveness of agricultural labor; it may be due to the unattractiveness of home. Attachment to ones' birthplace is always strong, and the force of the attachment is in proportion to the value of that birthplace as a home. The most important requisites of a perfect home are an intelligent man and a refined woman to preside over it; these being wanting the thing is impossible; being present, all else follows as a matter of course. Now the instinct of a New England boy protests against being a mere clodhopper, and when he sees this destiny before him he escapes from the farm to the city, where, his wits having been sharpened by contact with his fellows, he lives, or thinks he lives a higher life. If our farmers' homes were what they might be, few of their sons would be anxious to leave them; but, not finding there the intelligence which can change the drudgery of labor into a delightful employment, they go where the cravings of their nature can be better satisfied. When fathers cease to be guided by mere beaver instinct in the complex business of their farms, their sons will remain at home; and, uniting the vigor of youth with the wisdom of age, they will lighten the labor of life.

In my visits during the past season, I have met with many intelligent farmers who are deeply interested in all the agricultural improvements of the day, who read the periodicals and books on farming, and gladly learn from practical or theoretical men. They are inquiring for better methods, better implements,

and better stock, that they may, by increase of thought, lessen the wear and tear of muscle, and render farming a remunerative and intelligent calling. These men see that we have all been laboring in the dark, and to little purpose, and that the best way to escape from this humiliating condition is to accept information from any source, well knowing that it does not damage a thought to be expressed in a book, but that it is just as good as if it came from the next neighbor.

Among the various departments of agriculture, I find that dairy farming, when near a market, is generally thought in our county to be more sure to yield a profit than any other. Owing to insufficiency of good pasture, however, it is confessed that the business is not carried on without some considerable disadvantage. We shall soon learn how to improve our old, worn-out pasture land; then the dairy farmer will have no serious difficulty to contend with.

Of the dairies that I have visited, that of Mr. James Copeland, of West Bridgewater, is the largest and most interesting: and, by the kindness of the owner, I am able to give a rough outline of the business of the farm. In my conversation with him, he gave me many facts, with, however, but few figures: for, although he knows well what he gets for his milk, he does not profess to know what it costs him. He sells a great deal of milk, receives for it considerable money, supports his family, has bought a large farm and stocked it well, and all is paid for; of course the business is profitable.

The amount of work done on this farm is very considerable. There are two hundred and twenty-five acres under fence; forty-one acres in English mowing; thirty in fresh meadow; fourteen in tillage; and one hundred and forty in pasture. Ninety tons of hay are commonly made. The present year, two hundred bushels of corn and sixty bushels of wheat were harvested. The rest of the tillage is devoted to various kinds of vegetables; although Mr. Copeland does not grow any root crop for feed for his cattle. To consume the products of this farm, Mr. Copeland keeps, generally, about twenty-four cows, four horses, several yoke of oxen, and some young stock, making in all some fifty head. In addition to the hay and grain raised on the farm, it is found necessary to purchase feed to the amount of four hundred dollars. As feed for milch cows, Mr.

Copeland prefers shorts to corn-meal, as the former produces more milk. He does not think that beets can be raised cheap enough to take the place of shorts or meal. The milk is carried a distance of four miles to market, in North Bridgewater. When the demand for milk is not equal to the supply, butter is made; although Mr. Copeland prefers to sell the milk. In the selection of his cows he uses good judgment, making, I should think, but few mistakes. Without this skill in determining the quality of a cow, success would be impossible. The management of this large establishment, on the whole, is very creditable to its owner, although failing somewhat in neatness and in close attention to economy in details.

Throughout the county, I have observed that farmers are turning their attention more and more to their unreclaimed marshes. The white and yellow pine are again invading thousands of acres of poor land, which has become worthless for purposes of cultivation. On this account there is a constantly increasing necessity for more land of a better quality, and the most feasible way of accomplishing this purpose is to encroach upon the domain of the swamps. Now, before this can be done economically enough to justify the expenditure, two things must be well understood—the best method of removing the underbrush, stumps and stones, and the art of draining the land after it is so cleared.

The proportion of swamp land in the county is very great; and everywhere I observe farmers at work adding something to their meadow by substracting from their swamp. I have made every effort to obtain reliable information as to the expense of reclaiming such land, but as the work is generally done at odd times, when other work is not pressing, it is difficult to ascertain the cost. Of course the cost would differ very much, as the conditions of the land would differ; but the results obtained in reclaiming land in various districts, so that the swamps might offer every variety of characteristic, would satisfactorily determine whether it would be justifiable to hire men for this purpose, and set them to work reclaiming these watery wastes.

The most satisfactory experiment of this kind that has come under my observation, has been made by Mr. Robert Perkins of Bridgewater, who has kindly furnished me with statistics from

his memorandum-book, which give information very valuable to others who may contemplate making similar improvements.

In May, 1859, he purchased a lot of land of about eleven acres, situated quite near the village, a large proportion of which was swamp without any drainage. It was covered with oak, maple, birches, and dense underbrush, some of the trees being quite large. The surface was very uneven, and altogether it was a very discouraging-looking place. The following winter, for the purpose of making employment in the open air to improve his health, rather than with the expectation of making it pay, he commenced clearing off the trees and underbrush, and cutting a ditch through the whole length of the swamp. A hook was placed under the roots of bushes, by which means a yoke of oxen was able to draw out many. For taking out the stumps, a stump-puller, manufactured by Mr. Caleb Bates, of Kingston, was found to be very efficient, although the force employed was only three men. Without this machine, he thinks he should have despaired and given up the larger stumps; with it, every one came out, some of the largest measuring one and a half feet in diameter. The stones were also removed. When the underbrush and roots were dried, they were gathered into heaps and burned. When about one and a half acres were thus cleared, the ashes were scattered as evenly as possible, and a slight dressing of compost added, the whole surface having previously been dug over with a grub-hoe. After harrowing, the land remained undisturbed till spring. In April, it was seeded down to grass, and two tons of good hay were cut in July, and a large second crop in September. At different times, other portions of the swamp were cleared off in the same manner, to the amount of about three acres, at a cost of one hundred and twenty dollars per acre. In addition to this, about two acres were cleared by the job, at a cost of fifty cents per square rod, making the whole cost per acre about one hundred dollars. The whole is now covered with grass, and has no appearance of having recently been a swamp.

As Mr. Perkins had had no experience whatever in this kind of work, he labored under many disadvantages, and he is now aware that he could do the same work again at a much less cost. Expensive, however, as it has been, good judges who have seen the land think it will pay, as it is probable that, with a reason-

able amount of manure, it will produce three tons of hay to the acre. However this may be, Mr. Perkins does not regret the expense, as the labor of supervision has been very conducive to health, and an offensive swamp has been changed into a fruitful field.

The subject of draining, it seems to me, is not attracting that degree of attention which might be expected from intelligent farmers who have much land that is filled with cold, stagnant water, so destructive to all cultivated crops. Thousands of acres of the very best land in the county, now producing little but fresh hay, might, by draining alone, be reclaimed and made fertile.

The only improvement by draining with which I am particularly acquainted, has been made by Mr. Thomas O. Jackson, of Plymouth.

The soil of Mr. Jackson's farm is, for the most part, a heavy clay; and about two acres on a hill-side were found to be so wet late in the spring, that the season was not long enough for the successful cultivation of any crop. In summer the surface was hard, dry, and full of cracks. The subsoil is a clay pan, so hard that it had to be broken with a pick before it could be shovelled. A main drain, five hundred feet in length, of five-inch tile, was laid at the depth of four feet, with a fall of several feet down a hill-side. This drain was joined to a conductor, which leads into a pond. Lateral drains, one hundred feet in length, of three-inch tiles, intersected the main drain, which runs through the middle of the lot. These laterals were thirty-three feet apart, and on both sides of the main drain. The tiles were laid on the hard pan at the bottom of the trenches. The tiles were laid so as to touch each other, and then firmly wedged with stones, upon which a covering of small stones six inches deep, was placed, succeeded by a layer of large stones. Another covering of seaweed prepared the trenches for the earth which completed the drain. To exclude vermin, a copper strainer was placed at each end of the main, and a stone at the beginning of each lateral. The amount of land so drained was two acres.

The cost, which was greatly enhanced by the hardness of the clay pan, was nearly seventy dollars per acre. This expense is

evidently too great to encourage farmers to undertake the draining of wet lands by means of tiles.

The effects of draining this land are seen in the dryness of the soil, which enables the ploughing and planting to be done so early in the season, that the crops have time to mature. The removal of the water from the soil lessens the amount of manure necessary to produce good crops. About three-fourths of an acre, in a slight depression, near the top of the hill, which was a mud-hole in spring, is now a most fertile spot, covered with young fruit trees, and yielding abundant crops of roots. The first year the crop was light, owing to late planting. The second year carrots were planted, and yielded at the rate of five hundred bushels to the acre. The third year the crop was again carrots, increasing to the amount of six hundred and fifty bushels to the acre. The land was fairly manured each year. The remainder of the two acres is occupied by an apple orchard, which has been greatly improved as to the growth of the trees, and in the quality and quantity of the fruit.

There is another branch of farming in which I think I observe considerable progress throughout the county: I refer to sheep-husbandry. I do not recollect a single instance of a farmer who did not admit that it was profitable to keep sheep; but the difficulty of protecting them against dogs discourages most from undertaking the business. It is to be hoped, however, that as sheep increase, dogs will decrease in numbers. I cannot but think that our farming could not be improved by any one thing so much as by the placing of a flock of sheep on every farm. Almost every farmer has an abundance of almost exhausted pasture land, on which so large an animal as a cow cannot get a living; but a sheep will thrive where a cow would starve. In case pasture is wanting, sheep may be turned into the woods in summer; and if they are healthy, and in good stock order when they are turned out late in the spring, they may be expected to be fit for the butcher in the fall. Any farmer may keep sheep through the winter without having it cost him more than one dollar per head. Inferior hay and flat turnips may constitute a large proportion of their food. They would be a great advantage to the farm by destroying the bushes and briars in the rough pastures, and by enriching the soil with their manure. Fields, also, might be very cheaply

manured by feeding sheep in them during winter, preparatory to planting in the spring.

The sheep kept in our county are, for the most part, native, occasionally mixed with South Downs and other English breeds. However it may be as to the cattle of England suiting American climate and soil, there can be little doubt that English sheep are just what we want. We are situated near a market, and, therefore, need mutton sheep rather than those that produce superior wool. In improving their sheep the English seem to have had mutton almost exclusively in view, and they have reached so high a degree of excellence in this respect, that it would seem impossible to improve upon what they have accomplished. The great obstacle in the way of introducing these sheep generally into our county is the expense, which is greater than many of our farmers can bear; and those who can afford to buy, have not faith enough in the superiority of the sheep, before seeing them, to render them anxious to purchase. Among those who have taken much pains to possess themselves of good sheep, the most successful are Hon. Albert Fearing, Mr. Charles G. Davis, and Mr. Austin J. Roberts. Mr. Fearing has a few very fine sheep, which he imported directly from England. Mr. Davis's sheep are the Oxford Downs, purchased of Mr. Fay, of Lynn. The latter gentleman sold his lambs this summer for ten dollars, and buck lambs for twelve dollars to breeders, and the butchers paid him eight dollars for his ewes in the pasture, in June, after the fleece was off. Their fleece averages six to seven pounds. To get good sheep it is, perhaps, necessary that the buck only should be of pure blood. When we begin to take the interest in sheep-husbandry that the English do, the finest bucks will possess a great value, and their services will be sought after and liberally paid for. It is to be hoped the County Society will do all that is possible to advance the interests of sheep-husbandry by offering liberal premiums for the best sheep; and I have sometimes thought the society might even go so far as to purchase a few bucks of the purest blood, and of various breeds, and let out their services to the highest bidder. If the experiment should succeed in the case of sheep, the society might extend its operations to other stock; and, in this way, it would be in the

power of every farmer in the county to have the use of the best breeding stock of all kinds at a moderate expense.

I am by no means confident of the feasibility of this plan, and therefore only throw out the suggestion in the hope it may have sufficient interest to attract the attention and consideration of the trustees of the society.

CHARLES BURTON.

PASTURE AND WASTE LANDS.

ESSEX.

Report of the Committee.

The Committee to whom was referred the subject of the improvement of pasture and waste lands propose to confine themselves to but one topic in considering the question before them. They fully appreciate the efforts which are constantly made to bring the large tracts of unproductive land, both wet and dry, which occupy so much of the county, into the service of agriculture; and they take pleasure in congratulating the farmers of this section, in their renewed attempts during the past season to subdue their rough and swampy lands, for the purposes of cropping. But they feel that the most important consideration for the agriculturist here is, how he can best convert useless tracts into profitable pasture lands, or restore those which have suffered from over-stocking, or from neglect. While some sections of our State are capable of pasturing more cattle than can be kept during the winter, and thus lose a large portion of their summer feed, in Essex County the reverse is true. Here we can winter more cattle than we can summer. Our pastures are less productive than our hay-fields. And we are not only obliged to over-stock the former, but we are induced to resort to that most destructive of all farming operations, the sale of our hay. Except in those instances where, either from proximity to the sea, or from the supply of cities, manure can be cheaply and easily obtained, the neglect of pasture-lands and the removal of hay, must end in great

injury to the farm. He whose pastures fail, must sell his cattle. He who sells his cattle will sell his hay. And he who sells both cattle and hay, will ere long find that he must sell his farm.

The improvement of the pasture-lands of Essex County is, therefore, a matter of great importance to our farming community. We ought at least to keep them up to the capacity of our hay-mows; and, if possible, we should carry them beyond this.

It is doubtful whether any general rule can be adopted for the increase or improvement of lands devoted to grazing. The variety of tracts used for such a purpose, creates the necessity for a great variety of treatment; and the question is not so much how can pastures be cultivated, as how can they be cultivated to a profit. It is estimated that four acres of land are required for the pasturage of a cow; and it is probable that in their present condition nearly twice that number are necessary. The price of such land is about twenty dollars per acre. An acre which will serve the purpose of four, should be considered to be worth as much as four. How, then, can the farmer make twenty dollars' worth of land yield as much as eighty dollars' worth? How can he improve, moreover, the quality of his pasture grasses? And how can he economically provide himself with good luxuriant grazing, upon which he can rely during the entire season?

There is no doubt that, as a general thing, the cattle of Essex County obtain a somewhat scanty supply of food from the pastures. Brambles, and bushes, and weeds, and mosses, occupy a very considerable portion of the land called pasture, and are constantly encroaching upon that which is free from this burden. In the smooth pastures, the grass is short on account of over-stocking, and, in many instances, not nutritious on account of deficient cultivation or entire neglect. We have but little land like that in newly-settled countries, where the clearing of a forest is followed by a luxuriant growth of sweet grasses; and hence our business is chiefly with lands which must be restored from decay.

The application of various substances, such as ashes, lime, plaster, bones, &c., as a top-dressing for exhausted pasture-lands, has been tried and discussed, until its merits seem to be

pretty thoroughly understood. Wherever land is in a suitable condition to receive either of these fertilizers, great benefit arises from a judicious use.

On old worn-out pastures, however, something more is evidently necessary, especially where the soil is so far exhausted as to be incapable of restoration by rest, and where bushes have obtained the mastery. In such a case as this, resort must be had to the axe and bush-hook, to fire, the plough, manure and seeding.

How far the clearing, ploughing and seeding of pastures can be carried with profit, each farmer must judge for himself. In one or two instances, the experiment has been carried to a considerable extent in this county. A large tract of comparatively level land lying on the Merrimac River has been cleared of bushes, ploughed, and allowed to lie fallow one year. It has then been cross-ploughed, harrowed and seeded with rye and grass. In this case, the value of the land for grazing purposes has been largely increased. In the eastern part of the county, a hill-side pasture has been treated in the same manner; with what success we are unable to learn. It is possible that many acres of land now wholly unproductive, could be brought, by this process, into valuable pastures, without great expense, provided that the work is done in the intervals of more pressing duties during the season. The precise cost cannot be estimated, inasmuch as it would depend very much on the location of the land, and the time occupied in ploughing and fallowing. It is very desirable that some practical farmer should make an accurate return of the expense incurred per acre by this process. If it can be done advantageously, what a vast benefit would be the reclaiming of a few acres each year, on most of our farms. At any rate, we trust the time will soon come when every farmer who prides himself on his corn and hay crops, will learn that a growth of birches, bushes and briars on his pastures cannot belong to any good system of farming.

But one experiment in improving land was brought before the committee, and this is of a somewhat novel character. It consists of the clearing of old pasture-land for the purpose of orcharding; and although it does not come under the question which we have referred to, still it is entitled to careful atten-

tion. The experiment was made by Oliver P. Killam of Boxford, and we give his statement in his own words:

Statement of Mr. Killam.

The piece of land I offer for premium is one side of a lot containing ten or twelve acres. The part I cleared was covered originally with whortleberries, sweet fern, and briars, interspersed with small oaks, wild cherry, thorn bushes and birches. In the spring of 1849, I commenced setting apple trees on one side, one and one-half rods apart; set over about one-half an acre. The next spring I set out others; and in 1851, I finished setting over the piece I have cleared.

My manner of setting the trees is as follows: First, I mowed the bushes wherever I intended to set a tree. Then cutting away the roots with an axe, I dug the holes eight feet in diameter, and from one to one and a half feet deep. I usually dug the holes the year before planting the trees. When I set the trees, I pounded the sods, and picked out the roots, replacing the soil in the hole, and taking care to set the tree the same depth that it stood in the nursery. I then placed fine soil round the roots, and replaced the contents of the hole. The trees were manured and mulched; and they grew well for three or four years.

At this time the trees began to show signs of blight, which were not removed by digging about them; and I consequently determined to clear all the land between the trees. I commenced this in 1857, in the following manner:—

First I mowed the bushes, dug up the roots, and burned them. Then I dug out and cleared off the stones. I then ploughed it, removing all the stones and roots exposed to view, and harrowed it thoroughly.

The expense of clearing the first half-acre was:—

For one man one and one-half days mowing bushes, .	$1 50
Two men and four oxen one-half day pulling bushes and roots, ...	2 00
Two men and one yoke of oxen one day clearing stones,	3 00
Two days ploughing, ...	10 00
Clearing stones after ploughing, harrowing, and burning roots, ...	2 00
	$18 50

After it was cleared, I planted it with potatoes and corn. The expense of the crop was:—

For five cart-loads of compost in hill,	$5 00
For planting and hoeing,	4 00
	$9 00

Amount and value of crop:—

Twenty bushels of good potatoes,	$10 00
Eighteen bushels of ears of corn,	9 00
	$19 00

The fodder and small potatoes paid for harvesting. In the winter of 1857–8 I cleared another half acre at less expense. And in the June following, I sowed the whole with 13 quarts of buckwheat, and obtained fifteen and one-half bushels of clear seed.

Value of crop:—

Fifteen and one-half bushels of buckwheat,	$15 50
One ton of straw,	6 00
	$21 50

Expense of crop after clearing:—

Seed, sowing, and harrowing,	$1 00
Cutting, threshing, and cleaning,	1 50
	$2 50

I have cleared the remainder in the same manner, and with nearly the same result; averaging fifteen bushels of buckwheat and one ton of straw per acre yearly. I cleared three-quarters of an acre last autumn, at an expense of about $26.

I have manured what I first cleared, for two years, for the benefit of the trees; and I am satisfied that they have been improved by it to the full value of the crop raised on the land. By sowing buckwheat I have cleared the land almost entirely of briars and other noxious plants; and I am convinced that it is a good crop to raise in a young and growing orchard.

The experiment of Mr. Killam is an interesting one, and has been conducted with considerable economy and skill, and with

much industry. He has brought a waste piece of land into good orcharding; and his trees show that he has done it successfully. The committee award him the second premium of ten dollars.

They trust that they will see an increased attention to the reclaiming of pasture lands for grazing purposes, as one of the most important branches of the agriculture of the county.

GEORGE B. LORING, *Chairman.*

CULTURE OF TREES.

ESSEX.

Report of the Committee.

A few years ago, it was thought that our forest trees were fast falling before the woodman's axe, and that it was one of the most important objects to promote their growth. I had the honor, in 1838, to act on a committee of this society, with the Hon. James H. Duncan and the Rev. Gardner B. Perry, on forest trees; and the report of the doings of that committee may be found in the Transactions for 1839, awarding a premium of thirty dollars to Mr. Nathan Webster, of Haverhill, for his ten acre lot of cultivated forest trees.

Having the honor to hold a place on the same committee, the present year, which committee not having been called on by the chairman to attend to any claims for our premiums, it occurred to me to present to the Society some further account of the success of that experiment, and also some observations upon the subject of forest trees in general.

I did not at the time think that the amount of wood and timber in the county was likely to be greatly increased by the experiment; and by the report of the chairman, as published in the Transactions of 1839, I am led to think the committee were of nearly the same opinion; but as the chairman had tried an experiment, and was the only applicant, our first premium of thirty dollars was awarded to him.

The land was not well adapted to the growth of the kinds of trees for which our premium was offered. It had never been

ploughed, or pulverized, or cleared of roots and rubbish, except one acre. Furrows had been drawn across it, ten feet apart, and in the spring of 1836 and 1837, three pounds of locust seed had been sown; and in the fall of 1837, between one and two bushels of white oak acorns were planted, all of both kinds, along these furrows, in which they were covered with earth. From the locust seed, he supposed more than ten thousand plants came up; but from the acorns, not a single plant!

To secure the germination of the locust, he thinks it absolutely necessary to soak the seed in hot water—of course not too hot; and he imputes the total absence of young oaks to an early frost injuring the acorns; but as they could be easily found scattered along in rows, and slightly covered, I should rather charge it to the squirrels.

I would suggest to any person disposed hereafter to plant a forest, to completely pulverize the whole soil, and sow the seed broadcast on the furrows, and of various kinds, and at all depths.

As Mr. Webster sowed but two kinds of seed, and but one came up at all, we were called upon to look at only quite a number of locust trees, scattered over ten acres of ground; and as these looked rather unpromising, the generous premium must be considered to have been awarded rather to the labor of making an experiment, than to any promised success.

Mr. Webster says in his statement, that in 1835 the land was covered with birches, and some white oak and maple; and on examining the lot a few years afterwards, I was fully of the opinion that the growth of wood would have been quite as valuable had nothing been done but to exclude cattle from browsing upon the trees and under-wood of native growth.

I again examined the lot on the 13th of the present November, twenty-two years after the first visit and the premium, and I now consider the experiment rather more successful than I had previously expected, so far as the locust is concerned. About one acre, in one corner of the lot, is well covered with locust trees, thirty to forty feet high, and six or eight inches through, and in rather a thrifty state. There was a thin scattering of locust in other parts of the lot; and if locust timber is as lasting for fence posts, and other uses requiring durable

wood, as has been supposed, I should think the experiment might encourage the planting of the locust. The quantity and value of wood for fuel would probably have been larger had nothing been done. And if the acre so well stocked with locust is the acre which had been previously "ploughed, and planted with potatoes," it gives a valuable insight into the best mode of preparing the ground and planting. The white birch has now re-assumed its native rights over a large part of the ground, and the white oak and maple are, in a few instances, resuming their places.

I am not aware that any premium has been claimed or paid for the raising of forest trees since the one alluded to; and were it not that the law of the State requires the offering of them, I should suggest the discontinuance of the offer, as without effect, and, so far as fuel is concerned, quite unnecessary.

I am not aware that a single acre of open field, or pasture-land, has been changed from being an open field or pasture, in this county, within the period of my remembrance, which now extends to sixty years, by any deliberate design, planting or cultivation; and I am hardly aware that an acre has been cut down, cleared, and made a cultivated field or pasture, within that time. But within the last forty years, hundreds of acres have been overrun by the spontaneous growth of forest trees!

In the town of Groveland, it is easy now to show large tracts, over which men now living have held the plough, and swung the scythe and sickle, from which may now be cut from thirty to forty cords of wood to the acre; and by this growth, and the multiplication of fruit and ornamental trees, our landscape now presents a much more wooded prospect than it did forty years ago.

One cause of this great change is the neglect of agriculture, and confining it to fewer acres, since the prevalence of manufactures; another is, the now almost universal use of mineral coal. Most of this increase is the various species of pine.

White pine is a tree of very rapid growth; and I can now cut a frame for a good-sized house, from land from which the previous owner cut nearly all the wood which he considered worth cutting in 1838. What were then small trees, of a few feet in height, are now timber. The pine is a very sure and thrifty seedling, and I might now claim your premium for a

thousand trees of not less than three years old, all seedlings, and in a most thrifty state—and all growing spontaneously on what was, twelve years ago, chiefly an oak forest. The pine, I believe, never starts from the roots of an old tree, but are in all cases seedlings.

The oak seedling is of slow growth; but still they are constantly renewing from the acorn, in woods of thin growth, and around the margin of oak forests—the leaves affording them a sufficient covering, and the surrounding trees a sufficient shelter from the driving winds and snow; but the most thrifty growth of oak, maple and birch, are from the roots of previous trees, cut down before the life of both root and branches is exhausted by age. Crops of wood are now raised with as much regularity and certainty as crops of hay or grain, and are profitably taken off every twenty to thirty years. On thirteen acres of cut off land, which I purchased in 1851, at nine dollars an acre, there is now a crop of wood, principally oak, averaging fifteen feet in height, mostly sprung from the roots of the previous growth, and growing with great rapidity, from their large and abundant roots; while in almost every vacancy the seedling pines, before named, are shooting up their spires, and dispute with the oak for the final possession of the soil.

The white birch and the white maple push out numerous sprouts from almost every tree which is cut down, and spread spontaneously as seedlings, on the road-sides and on the margin of forests. A large hill in full view of my house, which was clear pasture land twenty-five or thirty years ago, is now an unbroken forest.

It belonged to the late Rev. Gardner B. Perry, who, with a view to improving his pasture, caused furrows eight or ten feet apart to be ploughed round the hill, keeping as near horizontal as possible, with the triple purpose of retaining the rain, ploughing up some of the moss, and manuring the intermediate space by the washing down of some of the soil ploughed up. The plan seemed well adapted to improve a smooth hill-side pasture, which it probably would have done, but that a copse of birches, forty rods off, furnished seed, and the winds did the sowing; and now we see a full grown and heavy crop of birch trees. Another neighbor's intervening lot remained unploughed, and is now smooth pasture-land.

Another reason why our wood increases so fast is, as before named the great increase of the use of coal as fuel. Twenty-one years ago, I was, with one exception, the only householder making use of coal in the town; now it is in use in almost every family; and for the last two years, nearly eight hundred tons have been imported and consumed—taking the place, according to my observation, of about sixteen hundred cords of wood!

Fifty years ago, it was a common thing for the farmers of Essex County to sell their farms and remove to newer States, in alarm at the approaching scarcity of wood and timber. My father-in-law, who sold his farm in what is now Georgetown, in 1780, and removed to New Hampshire, spent many anxious thoughts upon his old neighbors, how they were to get along when the fast decreasing woods were all consumed; forty years afterwards he returned to this vicinity, without finding any trouble in obtaining fuel! The committee who made the last valuation of this town, report that the wood is little, if any, diminished within the last forty years.

The walnut is a beautiful tree, easily raised from the seed, and of much more rapid growth than the oak. The wood is excellent, both for fuel and timber, and the fruit is highly valued, especially among children; and it is generally a good bearer.

The elm starts readily from the seed, which ripens in great abundance, before the leaves form, every spring, and may be sown and produce a thrifty plant the same year! It is a tree of great beauty, thrives in almost every soil, is of rapid growth, and produces valuable wood, both for fuel and timber. In 1845 I brought two trees under my carriage, both of which I could carry easily upon my shoulder at once, and set them out in the street in front of my house. The largest tree girths, by measurement to-day, one foot from the ground, three feet and two inches. A row of elms from the seed sixteen years ago, set from the garden on the river bank, are now, several of them, twenty feet high and six inches through.

I propose to add a few words upon Worms injurious to Forest Trees.

Mr. Coffin, in his History of Newbury, gives an extract from the margin of an almanac of 1736, written by the Hon. Bailey

Bartlett, which tallies so exactly with a similar calamity which visited this part of the county about 1797, that I will first copy it:—

"In the year 1734, a few caterpillars, of a peculiar kind, appeared on the oak trees as soon as the leaves began to grow. In 1735 a much larger number, one hundred to one, were seen, but in this year (1736) the number was astonishing. Almost all the woods in Haverhill and Bradford, (some part of the east end excepted,) the east part of Chester and Andover, many thousand acres of thick woods had their leaves and twigs of this year's growth entirely eaten up—so that the trees were as naked as in the depth of winter. They were larger than common caterpillars, and made no nests. No river or pond could stop them; they would swim like dogs, and travel in unaccountable armies, and completely cover whole houses and trees. Cart and carriage wheels would be dyed green, from the number they crushed in their progress!"

Mr. Richard Kelley, of Amesbury, in his diary, says: "They are larger than the orchard caterpillar, but smooth on the back, with a black streak with white spots."

I have never seen, in print or manuscript, any account of a very similar calamity which occurred within the memory of the writer.

About 1797, similar worms began to appear upon the oaks, which so increased in three or four years, that the oak woodlands were cleared of leaves, and the trees made no deeper shade in August than in winter! The white oaks enjoyed a partial exemption, but the red, black, and yellow oaks were entirely stripped of leaves. When they left the trees, they infested all the buildings which were near oak woods, and I have a pretty distinct recollection that their swimming qualities were then noticed.

Mr. Kelley's description does not apply exactly to these; they were mostly black, with a stripe of yellow on each side of the back, and crawled rapidly with many legs. The cart ruts, in a sandy road leading through my father's woodland, gathered them in myriads; and the crushing them as we carted hay through the woods, is distinctly recollected.

They disappeared about the third or fourth year, more suddenly than they came. The trees mostly survived, with many

dead limbs. The shrub oak was entirely stripped of leaves. I write from distinct and rather bitter recollection of what was then considered a great calamity, which excited much attention and many fears. Being but a boy, my observations extend only over the immediate neighborhood, in the west part of Georgetown; and this is written in the hope that from some old almanac, newspaper, or diary, a better account may be brought out.

About 1820, I discovered at the road-side, in Groveland, a small tree bent down with the weight of some hundreds of the genuine article. I destroyed every one; and whether in so doing I prevented a repetition of the former visitation, will never be known.

The canker-worms of the orchard sometimes infest the elm. It has been much damaged by them in this vicinity.

The blast which a few years ago invaded the plane tree or button-wood, has not, I believe, been satisfactorily explained. The tree remained perfectly healthy, and the damage occurred to the new growth as it put forth its tender leaves each year, leaving an unsightly knot where it attempted to produce its broad leaves. I examined many of these knots, but could never detect the living worm, though I was satisfied that the whole mischief was then and there, and perpetuated by a minute worm or insect, whose presence and operations it was difficult to detect or prevent. Its work seems to have ceased in this vicinity.

JEREMIAH SPOFFORD.

BRISTOL.

From the Report of the Committee.

While it is nature's purpose to reproduce and multiply, it has been our work to circumscribe and destroy. This work of destruction is constantly going on. On every hand is heard the woodman's axe, decimating our forests, demolishing the scanty remnant of the older growth among us, and with grub-axe and plough extirpating, root and branch, every chance seedling which a wise economy has planted for germination and growth.

We would by no means be understood as disapproving of the practice of cutting wood. It is only the indiscriminate sacrifice and waste of it so observable on every hand, we desire to stay. We wish to impress upon every man the desirableness of this kind of property; and induce him to adopt a course of policy which shall so increase the prospective supply as to admit of much larger drafts upon it without diminishing its quantity.

We would convince every landholder of the fact that he has no more remunerative property than his woodlands; none that gives a better return upon the investment; none more exempt from depreciation or loss; and none more easily convertible into ready means. And it is believed the growing of wood may be made even more profitable, by giving to it more care and attention. We think this crop should be managed somewhat as any other. That portion of the farm best adapted to its growth—and a part of every farm should consist of growing wood—should be set off for this purpose. In this selection, regard should be had to the nature of the soil, and the kinds of wood best adapted to it. If not already grown thereon, it should be planted; and the young growth properly cared for and protected.

The policy of cutting off our wood at shorter intervals than was formerly practiced is now generally regarded as wise and economical. While wood thus early cut is more valuable, the subsequent growth is more certain and rapid. In cutting wood, regard should be had to that season of the year which experience has shown most favorable to the development of the suckers and offsets. Whenever nature intimates a desire to change the variety, as is often witnessed in the up-shooting of the pine where a grove of oak has been removed, such preference should be generally acquiesced in; as in the growing of wood, as much perhaps as in any other crop, rotation includes greater vigor and fuller development.

While thus laboring to render our present woodlands more productive and profitable, our attention should be directed to the subject of enlarging their area. It is an opinion often expressed, that our farmers cultivate too much land. That much labor and means of fertility are lost by being too widely distributed, too thinly spread; and that a true economy points to more concentration of both labor and expenditure. How many acres of land do many of our farmers feel constrained to cultivate, to

avoid the appearance of thriftlessness, which barely returns the value of labor and seed bestowed upon it. And how much of every farm might be rendered doubly productive by a little more of that labor and nutriment now so widely scattered as to be in a great measure lost.

What our interest manifestly enjoins, is the contraction of the area of our grass and tillage land to the right limit of profitable farming; and after appropriating a sufficient breadth of the balance to pasturage, to devote every improvable rod of the remainder to the growing of wood; not a half naked, unsightly waste of scrub oaks and brushwood; but a plantation well set with varieties suitable for fuel, ship timber or mechanical purposes, such as the oak, ash, birch, maple, hickory and pine. It is only by heightening the productiveness and enlarging the bounds of our woodland, that we can hope to arrest this tendency to extermination; to bring up the supply to the measure of our probable wants, and to restore ourselves in some degree to our former condition of home reliance and domestic supply; a condition ever to be desired, but especially in times of war and blockades. For many years we have been becoming more dependent for the products of the forest, upon others. The lumber for our houses, the timber for our ships, the bark for our tanners, the materials for all our mechanics who work in wood, has been sought for abroad. And this want will continue to be felt until we commit ourselves more fully to that course of policy in this regard, which our highest interest so plainly points out.

But there are other considerations we would present as an inducement to the cultivation of trees. If, as we are told, nature abhors a vacuum, so also does she loathe nakedness. While she cannot consent to the one, she puts forth all her efforts to prevent the other. To clothe her offspring, to hide her deformities, to array in robes of ever varying hue and form her manifold creations, is her earnest purpose. To carpet the ocean's bed; to drape the mountain's crags, with her mosses and lichens; to plant on hill-side and plain, in meadow and dell, her grasses and ferns; to rear in the valley depths, and on the mountain heights, her pines and her oaks, her cypresses and her cedars, is her pastime. Ere man was created, before the sun, moon, or stars were set in the heavens, even on the third day of the work of

creation, were the trees "bearing fruit after their kind, pleasant to the sight and good for food," brought forth. Thus occupying so important a place in the preparation of man's abode, they have exerted a mighty influence through all his history upon his character and life. To trees in their countless forms and variations, their natural and artificial groupings and combinations, more than to all other of nature's external forms, is man indebted for the development of that higher type of character and culture, those noble qualities of mind and heart which constitute his crowning glory. The first objects to meet his eyes, as in some sylvan retreat, he awoke to an immortal life, they have been his instructor and model, his protection and guide, his unfailing support through all his wanderings. Ever above and about him, they have been his constant suggester of those rudimental principles of architectural science, by which he has erected in every age, those magnificent structures of taste and art. As he has moved among these noblest forms of vegetable life, awed by their grandeur, enchanted by their beauty; his thoughts have been raised above their aspiring tops, and while contemplating their visible forms, his heart has yearned for a more intimate knowledge of their Author. Intimately associated with the earliest recollections of childhood, gratefully remembered among the sports and pastimes of our juvenile years, closely identified with every experience of subsequent life—with its joys, its sorrows, its blessings—they have become woven into the web of our being. They enter into all our ideas of beauty, taste and comfort. No feature of nature is so unattractive as its sandy beaches, its barren plains. No solitary wilderness has half the terror and gloom of those frightful deserts of burning sands and suffocating winds which devour, as the breath of a furnace, every living thing. No isolated dwelling, however grand and imposing its architectural proportions, but standing like our New England churches of the olden time, upon some naked mound, far away from tree, or copse, or grove—cold, cheerless and repulsive, is to be mentioned for its beauty, taste or attractiveness in comparison with the neat, cosy, though unostentatious home, embosomed within lines and curves and groups of evergreen trees, of flowering shrubs, of fruitful orchards, of twining woodbine and trellised honeysuckle; vieing with each other in the work of adornment; where the welcome songsters of the

grove chant their morning song, and trill their evening lay; and where the sweet voices and joyous sports of happy children are heard and witnessed. For be it remembered, this is childhood's Eden—this its congenial home. This is heaven's nursery, wherein to rear its choicest plants for an immortal bloom. While a kind Providence seems ever reluctant to commit its offspring to the stiff formalities, the stinted sympathies, the cold affections of the palatial prison, it bestows them in larger measure, and with apparent delight, upon the open arms, the gushing affections, the overflowing bosoms of sympathy and love, which are to be sought in these sylvan homes.

But we would present other considerations of more general interest perhaps to our farmers, more pertinent to the occasion and more in harmony with the purposes of our organization. It is a well settled fact in physiology, that trees, forests, exert a controlling influence upon the climate; taming its wildness, mitigating its rigors, neutralizing its repellant forces and moderating its excesses. One of the most serious hindrances to the farmer's success are the high winds which at times prevail among us. They sweep over his cultivated fields, prostrating his grass and his grain. They drive through his orchards, twisting and breaking his trees, and forcing the fruit prematurely from the branches. They rage and howl in wintry blasts over his fallow, dissipating its grasses and bearing away its soil. Trees exert a no less powerful influence upon the climate in relation to its dryness or humidity. Other obstacles to successful farming, are the sharp droughts and deluging rains which are becoming of so frequent occurrence, and which will increase in frequency and severity as the country becomes more denuded of its forests. Trees render more gradual and uniform the evaporations from the earth's surface, by conducting through their entire organism,—through roots, trunk, branches and leaves, the moisture that lies below the reach of ordinary vegetation, to the atmosphere above; which thus becoming overcharged with moisture, returns it in dews and showers upon the thirsty earth. Trees afford us protection from the tempest; disarming it of its force, and diverting the descending fluid from our persons and dwellings. They are the natural pathway for the lightning in its passage from the clouds to the earth; from its storehouse in the skies, to its depositories in the deep recesses

of the earth. With arms extended skyward, trees receive upon their innumerable points the electric fluid of the overcharged cloud, and convey it harmlessly through every fibre of their organization, to the earth beneath. Thus, while invigorating themselves by imbibing this vital principle, this propelling force, they deprive the atmosphere of its retentive power, and cause it to dispense its moisture in refreshing showers and fertilizing dews on forest, field and flower.

These are some of the offices which in the vast economy of nature, have been committed to our shade and ornamental trees, our orchards, our groves and forests to perform. Other services of perhaps equal value, but to which we have not time to allude, they certainly discharge.

This labor then of planting and growing trees commends itself to every consideration of worldly policy, and to the noblest sentiments of our nature, to the close calculation of temporal interest, and to that inborn faculty of the human mind, to appreciate the picturesque and beautiful, which can never be eradicated.

Every individual who plants a tree becomes thereby a benefactor. He thus adds one to the number of these grandest productions of the vegetable kingdom, to that loyal army of defenders, which, with its ensigns waving in every breeze, its banners ever unfurled, constitutes in an important sense, our protection and defence. In every tree we fell, we strike down a faithful sentinel, which without fee or reward, by night and by day, through sunshine and storm, is ever at its post, protecting us from the scorching heat of summer, the chilling blasts of winter; challenging every approach of wind or storm, saying, thus far and no farther shalt thou come, and here shall a portion of thy fury be staid.

We desire to impress upon all the expediency of giving more attention to this subject. Upon every young man about entering upon the more responsible duties of life; to assume those high trusts, those sacred obligations pertaining to the family and the home, we would urge the policy of planting trees. After securing a good title to your land, appropriate the first few dollars at your command to stocking a portion of it with a carefully selected assortment of fruit and ornamental trees. You thereby increase its value, you contribute to its attractive-

ness, you make it more truly what is implied by the endearing name of home. You thus promote the health and happiness of your children, by supplying them with those wholesome fruits which their growing constitutions so earnestly crave. You associate their years of childhood with objects of pleasure and gratification, with exhibitions of nature's beauty and loveliness. You give them impressions of domestic life, of social enjoyments, of filial and moral obligations, *which no future condition of life can efface*. The man doomed to single life, who lives in the present, not in the future; whose earthly being is bounded by the narrow horizon of a single term, we would counsel to grow trees. Having by some dispensation of Providence, or more probably by your own perverseness, failed to subserve an important purpose of your being; what service can you render, what labor can you perform so efficacious as this for saving your memory from oblivion; your name and your form from descending to the same silent abode? So that if your children shall not hereafter rise up and bless you, some wayfaring stranger, some future sojourner, while refreshed by its shade, or regaled with its fruits, may inquire the name of their benefactor. Upon all possessed of the requisite ability we would press the value and importance of this work. In this, as in many of the higher duties of life, we perform a double service. While we contribute most directly to the wealth, comfort, and prosperity of the next generation, we derive the present reward which such service ever imparts—a reward not unlike that bestowed upon the training of children, the rearing of domestic animals. But it is only by the performance of this triple service, the enumeration of these three paramount obligations in the catalogue of secular duties, that we can claim to have discharged the full measure of life's labor, and therefore the enjoyment of its rewards.

WILLIAM BREWSTER, *Chairman.*

VINEYARDS.

WORCESTER NORTH.

Statement of Jabez Fisher.

The "Plantation of Native Grapes" to which I have invited your attention, consists of fifty-two vines in a single row. The vines were grown by layering in 1856, and set in their present location in the spring of 1857. The exposure is a gentle slope to the south and east, with shelter on the north and west. The soil is a strong loam resting on a clayey substratum. Water having been found to stand within two and one-half feet of the surface occasionally during the year, especially in spring and autumn, a drain was laid previously to planting the vines, directly underneath where they now are, three feet deep. Tile was used for the bottom, and small stones were filled in above to within eighteen inches of the surface. Upon these a layer of horn waste was spread, and loam filled in to the top. The ground was not trenched nor otherwise specially prepared, only as it had been left after the cultivation of ordinary crops. The variety was the "Concord," and the vines were set six feet apart. In 1857 they were allowed to grow at random, and in the fall were pruned, as they had been at time of planting, to two or three eyes. In 1858 a single cane from each vine was trained to a stake, and at the autumn pruning cut back to about two feet.

In the spring of 1859, a trellis was erected of posts and wire. The posts were chestnut, two by two, set two and one-half feet in the ground, and rather more than five feet out, at the distance of ten feet apart. At each end, a post, three by five, was set in a foot and braced. Upon these posts four strands of No. 12 iron wire were stretched, the lowest eighteen to twenty inches from the ground, and the others at distances of fifteen inches. The strength of one man with a little skill is sufficient to stretch the wires in warm weather. At each end the wires pass through holes in the posts, and are secured by driving the bent end into the wood, assisted by a staple made of the same wire. The wires are fastened to the other posts by staples driven into one side of them. The posts were entirely covered with coal or gas tar, and

a coat of the same was applied to the wire, but I now prefer an asphaltum, or paraffine varnish for the latter.

The mode of training adopted was, to carry up a single cane to the top of the trellis and allow four arms to grow from each side, to be secured to the four wires. These laterals were twisted around the wires as they grew, and required no tying. In the autumn the wood was cut back according to the strength of the vines, leaving the trellis two-thirds full of bearing wood. A few clusters of fruit grew this season on most of the vines.

In 1860 a fine crop of grapes was produced, which in consequence of the backward and moist season, had not arrived at maturity at the first of October. At that time, during two or three successive nights, the thermometer marked a temperature of thirty degrees, and the berries and leaves were frozen through. A few days subsequent to this date, a warm rain caused all the leaves to drop, leaving upon the trellis a most beautiful show of purple clusters, many of which weighed three-fourths of a pound each. The fruit was worthless for the table, but made a very fine jelly. The wood was only partially mature, and gave poor promise of wintering well. The vines could not be laid down, in consequence of the manner of training, and were left at the mercy of the elements. On the 8th of February last, the mercury descended to twenty-two degrees below zero, having gone down fifty-eight degrees in twelve hours. A considerable portion of the wood itself was killed at this time, and as vegetation commenced in spring, it was found that with only two or three exceptions, every bud, both primary and secondary, were dead. The snow, at the time of this extreme cold, was two feet deep, covering the lower wire of the trellis, and as a consequence the lower laterals or arms of each vine. This portion of all the vines was found to be uninjured, and is this season giving a crop of fruit, the clusters being considerably smaller than usual, consequent, as I suppose, on the immature condition of the wood when vegetation ceased in 1860. As soon as the foliage had become developed the past spring, each vine was cut away just above the lower arms, and six canes were trained perpendicularly, a foot asunder, to the top of the trellis. The wood is now, (Sept. 25th,) in quite an advanced state of maturity, and the fruit is well colored, promising to be ripe in another week of favorable weather.

My mode of pruning is as follows: As soon as the shoots in spring have advanced so as to show the clusters of buds, I pinch each one at one joint beyond the first cluster, unless the second is of good size, in which case both are left, but never more than two. All superfluous shoots and buds are rubbed off. As growth progresses, I pinch a second, third, and sometimes a fourth time, according to the luxuriance of the vines, after which every thing is left to grow at random. After the fall of the leaf every thing is cut away, except those buds which are wanted for the next season's fruiting.

The ground has been fairly fed for crops of vegetables, &c., but has received nothing especially for the vines, except the horn waste before mentioned. The growth has been uniformly too luxuriant, and the canes too long-jointed. This tendency I hope to overcome by withholding stimulating manures, and shall apply only those of the opposite character.

Statement of W. G. Wyman.

The "Plantation of Native Grapes" which I offer for a premium, consists of forty-seven vines, viz.: twenty-nine Concord, six Diana, four Isabella, three Seedling, two Catawba, one Rebecca, one Hartford Prolific, one Delaware. They were set as follows, viz.: In the spring of 1857, one Concord, from which all the Concord plants were obtained by layers, two Diana, two Catawba, three Isabella, and three Seedling; in 1858, two Concord; in 1859, two Diana, three Concord and one Isabella; in 1860, eleven Concord, two Diana, one Rebecca, one Hartford Prolific, and in 1861, twelve Concord and one Delaware. Twenty-seven are in two rows twelve feet apart, on the south side of a high, tight board fence, in my vegetable garden. The plants are twelve feet apart in the rows. Between the rows an under-drain was laid, varying from two and one-half to three and one-half feet deep; trenches were dug for the vines about twenty inches to two feet deep and three feet wide, and filled with brush at the bottom, (mostly old wild grape vines,) covered with bones, waste leather, old woollen clothes, turf and good soil; the vines set in the soil, without other manure, and subsequently manured with ground bone, super-phosphate of lime or ashes, each year until the present, most of them not being manured at all this year, except as

they get the benefit of the manure in the garden across a border of six feet. Twenty are in one row, ten to twelve feet apart, on the west and north sides of my fruit garden, east and south of a heavy wall; the land by them was underdrained from three to four and one-half feet deep, and the plants set in nearly the same way, except that for a part of them, the soil having been made deep and rich previously, they were set without any additional preparation. I prune in the fall, cutting back nearly to the ground the first two years, and then training them to the trellis, which is of wire, until they fill it. I always lay the vines upon the ground for winter, covering the more tender ones slightly with earth, and have never had one, that was so protected, injured, after it had become established in the soil. I do not like to have other plants grow near the grapes, within at least six feet, and endeavor to keep the soil free from weeds, and mellow on the surface, stirring it frequently through the entire season. After the grapes have set, I thin them, and pinch in the ends of the vines frequently for several weeks.

In 1860, fifteen of the vines bore freely, the fruit being of good size and form, both bunch and berry, but on account of an early frost, did not ripen perfectly, with the exception of the Seedlings, which being very early, were gathered before the frost, which occurred about the first of October. The present season the crop has been abundant on all of these vines, and nearly all the others set previous to this year commenced bearing fruit, and the fruit has ripened perfectly, without protection, even on the Catawba vines.

I obtain new plants mostly by layering. When pruning in the fall, I save such vines near the ground as are suitable for the purpose, and after they have started in the spring, I bury them slightly in the soil, after having first cut them a little more than half off between the eyes; each eye then usually produces a good plant for the next year's setting. I have, however, this year raised several hundred plants from cuttings saved at the fall pruning, buried in the ground over winter and planted in the spring, but they are not so strong or good as layers.

MANURES.

ESSEX.

From the Report of the Committee.

The committee on manures report that there was transferred to them, by the committee of last year, the statement of Benjamin P. Ware, of Marblehead, of his first year's experiment upon the proper depth of applying manure. As the whole experiment is to extend over a period of three years before any premium can be awarded, it is, of course, too early to speak of Mr. Ware's experiment, except to express the hope that it may be carried through, as the results, in the hands of so careful a cultivator, cannot fail to be of practical advantage.

Mr. Ware enters, for the general premium of the society, an additional lot of land adjoining the five lots in course of experiment for three years. He shows by this experiment the benefits of a liberal supply of manure, and the comparison he has instituted in this respect, commends itself to the committee as worthy of the first premium, of fifteen dollars. His statement will be found replete with interest. To understand the treatment of the five other lots, with which No. 6 is compared, reference may be had to the report on the Treadwell Farm in the Transactions of 1860.

The committee are happy to say that having learned that Richard S. Rogers had instituted a series of experiments in top-dressing, upon his farm in South Danvers, they have been favored by him with a statement hereto annexed, showing the results of the same. From these experiments of two consecutive seasons, it appears that green cow-manure has, with him, proved the most efficient fertilizer as a top-dressing—a fact which cannot but excite surprise and attention, as being so widely at variance with the general practice and theory. But *facts* are what is wanted, and they should receive our candid and careful consideration. In confirmation of the experiment of Mr. Rogers, we will quote from the Journal of the Royal Agricultural Society for 1860, Part II., page 342, a note to a

prize essay, by Professor Turner, on the application of manure to the farm :—

"I find the action of manure taken fresh from the yards in July so satisfactory, that I feel no inducement whatever to keep back the more costly, well-rotted manure for this purpose. With the uncertainty how the season may alternate between showers and a powerful sunshine, I cannot wish the ammonia in the dung to be in a forward state of development. If the supply of food is small at first, but increasing as the herbage grows round, through and over the dung, waste will be most effectually prevented."

We commend the above views in connection with the experiment of Mr. Rogers, to our thinking farmers. The experiment has been carefully made, and the statement of it is admirably drawn up. We take great pleasure in placing it upon our records, in the Transactions, confident that it will help sustain the high character they have had in the past, and which it is our duty to endeavor to give to them in the future.

ALLEN W. DODGE.

Statement of Benjamin P. Ware.

Upon the 20th of April, the land, (a description of which may be found in my last year's statement,) being sufficiently dry, I ploughed it eight inches deep, and then harrowed it. May 30th, I cross-ploughed it, harrowed and dragged it, which left the land in good condition for the seed. June 1st, I sowed with orange globe mangolds in drills, twenty inches apart, ten drills in each lot, using no manure upon any of the five lots. I propose to continue the experiment upon lot No. 6, by the spreading upon the furrows, after the cross-ploughing, fine compost manure, composed of meadow mud, sea-kelp, and stable manure, of equal parts, the whole drenched with night soil forked over several times until well mixed and pulverized, at the rate of nine cords per acre, which was harrowed in. In all other respects, this lot was cultivated precisely as the other five. Hoping by this experiment to prove the profit or loss of the annual use of a liberal quantity of manure, in comparison with none at all or once in three years, the experiment on this lot I respectfully offer for the Society's premium, independent of

the premium offered for the three years' experiment on the other five lots.

The crop was hoed three times, and weeded by hand twice during the season. At the second weeding, the plants were thinned to six inches, and all vacancies were filled by transplanting.

October 29th, the crop was pulled, topped and thrown in heaps, where it remained one day to dry before weighing.

Lot No. 1 produced	3,170	pounds,	at the rate of	25	tons,	720	pounds	per acre.
2	"	3,160	"	"	24	"	1,560	"	"
3	"	3,200	"	"	25	"	1,200	"	"
4	"	2,810	"	"	22	"	960	"	"
5	"	2,110	"	"	16	"	1,860	"	"
6	"	4,500	"	"	36	"			

Thus showing a balance in favor of lot No. 6, as compared with lot No. 5, (where no manure was applied last year,) of nineteen tons one hundred and forty pounds per acre, which, at eight dollars per ton, the market value this year, (much less than last, or many previous years,) would amount to . .	$152 56
Deduct value of nine cords manure, at five dollars, .	45 00
Net profit in favor of the manure for this year, .	$107 56
The effects of manure upon the second year's crop, may be seen by deducting the weight of the crop of No. 5 from the crop of No. 1, which is eight tons eight hundred and sixty pounds, at eight dollars,	67 44
Which, added to this year's profit, makes a total of	$175 00

in favor of the liberal use of manure upon one acre against using none.

A Synopsis of the Weather during the last season.

	First Third.	Second Third.	Last Third.
May, ...	moist.	dry.	moist.
June, ...	moist.	dry.	dry.
July, ...	very dry.	moist.	moist.
August, ...	moist.	moist.	moist.
September, . . .	dry.	dry.	dry.

MARBLEHEAD, November 12, 1861.

Statement of Richard S. Rogers.

In consequence of a generally expressed wish to learn my second year's results in top-dressing of grass lands, I am induced to give the results of a series of experiments made by me for two consecutive years—the first in 1860, which was published in the "New England Farmer" of February of the present year,—and of those made this season; and for the better information of those who may not have had an opportunity of seeing them at the time they were published, I have thought best to embody them in the present statement. They were as follows:—

There is no subject in agriculture deserving of more inquiry, and of greater importance to the farming interests, than the knowledge of the best kind of fertilizers to be used for top-dressing grass lands. As yet, but little is actually known by which to arrive at any practical results for obtaining the largest crop of grass.

I have read very carefully the remarks and discussions had at the several meetings in the State House on the subject, and as yet am far from the information desired. Theories and crude speculations will not enlighten me in the case, and it is only actual experiments and comparison of the several kinds of fertilizers in general use, that can afford the valuable information so much wanted by every farmer. When these experiments are made, and clearly explained, they will open to us a knowledge of vast importance. For what crop is there of greater value than the hay crop? With the present implements now used in husbandry, none can be more easily produced, for the means are within the reach of every one, either by owning or hiring the best mowers, tedders and others machines necessary for the purpose.

The desire of knowing something more definite and practical on this interesting subject, induced me, the last season, to institute, in a small way, a series of experiments, in the hope that I might derive some benefit myself and be useful to others. Accordingly, in April last, I selected a field best adapted to the purpose—very uniform in the sward, free from shade and other objections—and staked out five several lots, each measuring

two hundred and fifty feet long by forty-five feet wide, and top-dressed them with the various fertilizers, as follows:—

No. 1. Two cords of manure, well rotted and mixed with one and one-half horse-carts of soil.

No. 2. One hundred and twenty bushels leached wood ashes.

No. 3. Two cords green cow-manure, the droppings of only a few days before.

No. 4. Eighty bushels unleached or dry wood ashes.

No. 5. Two hundred and fifty-five pounds pure Peruvian guano, mixed with one and one-half horse-carts of brook mud.

The cost or value of the top-dressing, for each lot, was as near ten dollars as possible. The grass was very carefully cut and made—the first crop in July, the second in September—and accurately weighed, yielding as follows:—

	1st Crop.	2d Crop.	Aggregate.
No. 1, . . .	790 lbs.	380 lbs.	1,170 lbs. Compost.
2, . . .	680 lbs.	440 lbs.	1,120 lbs. Leached ashes.
3, . . .	960 lbs.	640 lbs.	1,600 lbs. Green cow manure.
4, . . .	900 lbs.	550 lbs.	1,450 lbs. Dry ashes.
5, . . .	1,300 lbs.	370 lbs.	1,670 lbs. Peruvian guano.
	4,630 lbs.	2,380 lbs.	7,010 lbs.

You are aware the early spring was very dry, and quite a drought prevailed during the months of April and May. This no doubt retarded vegetation, and checked, particularly, the fertilizing qualities of the ashes, as they laid in the sward for a length of time as dry as when first spread. The copious rains afterwards produced a wonderful change in thickening up of the grass. The guano dressing, you will observe, produced much the largest quantity on the first crop, although very little more than the green cow-manure with the aggregate of both crops.

The second mowing of the guano lot disappointed me, and its short-comings on the second crop almost conclusively proved

that it had lost much of its fertilizing properties in the production of the first crop of grass. It would not surprise me, on the return of the next season, to find the green cow-manure lot superior, and more reliable, than either of the other fertilizers as a general dressing. Should the return of the next year's mowing result as I anticipate, I may possibly trespass upon your valuable paper at a future day."

Having given the statement of 1860, I now proceed to show the results of the present season, wishing it to be distinctly understood that no additional top-dressing of any kind has been applied since the spring of 1860:—

	1st Crop.	2d Crop.	Aggregate.
No. 1, . . .	850 lbs.	240 lbs.	1,090 lbs. Compost.
2, . . .	980 lbs.	420 lbs.	1,400 lbs. Leached ashes.
3, . . .	1,300 lbs.	450 lbs.	1,750 lbs. Green cow manure.
4, . . .	1,350 lbs.	540 lbs.	1,890 lbs. Dry ashes.
5, . . .	730 lbs.	140 lbs.	870 lbs. Peruvian guano.
	5,210 lbs.	1,790 lbs.	7,000 lbs.

In order to show this year's results, the stakes were very carefully preserved, and great care observed in mowing the several lots, and especially as to the true weight of each. It will be observed that the difference in yield of the aggregates of 1860 and 1861, is very small—the former being 7,010 pounds, the latter 7,000 pounds, and yet it will be perceived that there is a great difference in the results of the several fertilizers used in these experiments; but when looked at separately, this difference is satisfactorily accounted for.

Having already given a statement of last year's results, as well as those of this year, I shall now confine my remarks principally to show where this difference happens. On looking over the results, it will be found mainly in the falling off of the guano-dressed lot, and in the great increase in the ashes lots: for the guano lot gave this season, on its first cutting, only

730 pounds (against 1,300 pounds last year); on the second, only 140 pounds (against 370 pounds). The dry ashes very much increased—the first giving 1,350 pounds (against 900 pounds last year); on the second, 540 pounds (against 550 pounds). The green cow-manure did well both seasons. The leached ashes likewise did well.

I am satisfied, from a close observation and from practical results, that *green cow-manure* is one of the best fertilizers, and the safest to be used for top-dressing of grass sward.

The compost lot resulted about the same both years. The results of the two years—1860 and 1861—will be found as follows:—

	1860.	1861.	Aggregate.
Number 1, ...	1,170	1,090	2,260
2, ...	1,120	1,400	2,520
3, ...	1,600	1,750	3,350
4, ...	1,450	1,890	3,340
5, ...	1,670	870	2,540
	7,010	7,000	14,010

From the foregoing statements, the dry and leached ashes and cow-manure show the best results as fertilizers; and, as stated last year, had the months of April and May given their usual quantity of rain, instead of being very dry, the ashes, particularly, would have added very much to the crops; but vegetation was generally checked, and the ashes did not act so powerfully as they otherwise would.

The Peruvian guano is a *great stimulant*, and can be used for some purposes to great advantage; but as a durable or permanent top-dressing for grass—excepting for one crop—I should doubt its efficacy. As a proof, witness the first cutting last season, which was 1,600 pounds, and the first cutting of this season, only 730 pounds; and the second only 140 pounds. In fact, the appearance of the sward at this moment, dressed

by the guano—and the other lots by ashes and green cow-manure—is most striking: that by the guano is almost entirely dry and seared, while the others are clothed with almost luxuriant verdure.

Having turned my attention very particularly to top-dressing of my grass lands, for several years past, I may be permitted to speak very confidently of the great advantages to be derived from practicing it; and perhaps have realized as much benefit as any one from pursuing it.

Oak Hill, South Danvers, October 29, 1861.

Report of the Experiment on the Application of Manures on the "Treadwell Farm," the year of 1861, competing for the Premiums as offered by the Massachusetts Society for the Promotion of Agriculture, and also by the Essex Agricultural Society.

Land selected; level.

Amount of land; two and one-half acres.

Quality of land; light, dry, not retentive of manures.

Crop of 1860; grass.

No manure in 1860.

Kind of manure used 1861; stable manure which had been thrown into the hog-yard from day to day.

Amount; twenty cords.

Depth of ploughing; eight inches.

Five cords applied to Lot No. 1, and ploughed eight inches deep the whole field.

Five cords applied to Lot No. 2, and the whole field cross-ploughed four inches deep.

Five cords applied to Lot No. 3, and the whole field harrowed twice.

Five cords applied to Lot No. 4, and left exposed on the surface.

Lot No. 5, no manure.

May 13th, 1861, the whole piece was planted with corn known as the "Flint Corn," the hills three and one-half feet apart each way.

June 10th, cultivated the whole field, both ways, and commenced hoeing, and hoed the whole field, keeping the land level.

June 17, cultivated the whole field, both ways.

June 25, cultivated the whole field, both ways.

June 25, 26 and 29, cleared out every weed to be found.

July 2, cultivated the whole field both ways.

July 8, cultivated the whole field both ways.

August 13, 14 and 15, sowed winter rye and grain seed, as per order, and hoed over the entire field.

Corn harvested October 16th to 20th, 1861.

Amount of corn and weight of corn stover—

	Amount of Corn.	Weight of Stover.
No. 1, . .	56½ bush. ears.	2,950 lbs.
2, . .	50 "	2,270
3, . .	43 "	1,330
4, . .	37½ "	1,270
5, . .	15 "	500

Weather Report of 1861.—*Amount of Rain.*

May,	first third, 0.952 in.;	–	–	last third, 1.106 in.		
June,	" 2.255 in.	–	–	–	–	
July,	" 0.394 in.;	second third, 1.247 in.;		last third, 0.544 in.		
Aug.,	" 1.564 in.;	" 2.210 in.;		" 0.554 in.		
Sept.,	– –	" 1.561 in.		–	–	

Experiment of 1860 *continued.*

Land ploughed six inches deep.

April 29, 1861, barley sown, five bushels; grass seed, red-top, three bushels; clover seed, fifteen pounds. Well harrowed and rolled.

July 29th, harvested.

Weight of barley and straw, and quantity of barley—

	Barley and Straw.	Quantity of Barley.
No. 1, . . .	730 lbs.	2¾ bush.
2, . . .	970	6¼
3, . . .	970	6½
4, . . .	1,060	5
5, . . .	660	3¾

MIDDLESEX NORTH.

Statement of J. B. V. Coburn.

I have continued the experiment on the application of manures, &c., through the season of 1861, and send you the following result. The lots you will perceive from my last year's report contained just one-fourth of an acre of land each, and were ploughed and sowed the third week in April; ploughed about seven inches deep; harrowed once before and twice after sowing; sowed about two bushels to the acre. Each lot was harvested and threshed separate, and the result is as follows:—

No. 1, . . .	wheat, $4\frac{7}{8}$ bush.;	straw, 480 lbs.
2, . . .	" $5\frac{1}{2}$	" 600
3, . . .	" 5	" 520
4, . . .	" 6	" 650
5, . . .	" $2\frac{1}{2}$	" 240

A Synopsis of the Weather from May 1st to October 1st.

	First Third.	Middle Third.	Last Third.
May, ...	dry.	dry.	dry.
June, ...	moist.	moist.	moist.
July, ...	moist.	moist.	moist.
August, ...	dry.	moist.	dry.
September, . . .	moist.	wet.	wet.

WORCESTER NORTH.

Statement of W. G. Wyman.

Being requested by last year's committee on experiments to notice and publish the condition of my field this year, I offer the following statement of the continuation in 1861 with grass, of my experiment commenced in 1860 with wheat, on the effects of different kinds of fertilizers, as compared with none. The division of the field into lots, and the numbers of them, are the same as in 1860.

The weight of clover hay and rowen, when thoroughly dried on an average rod, is as follows:—

No. 1,	hay, 41 lbs.;	rowen,	21 lbs.;	total,	62.	Rate per acre,	4	tons,	1,920 lbs.
2,	" 37	"	12	"	49.	" "	3	"	1,840
3,	" 33	"	21	"	54.	" "	4	"	640
4,	" 28	"	8	"	36.	" "	2	"	1,760

At $10 per ton for the hay and rowen, the value of the fertilizers for the present crop, per acre, is as follows :—

Stable manure on	No. 1,	$20.80	for	2 tons	and	160 lbs.	increase.
Ground bone on	2,	10.40	"	1 ton	"	80	"
Super-phosphate on	3,	14.40	"	1 "	"	880	"

As compared with no manure on No. 4.

By comparing this with last year's statement, published on the seventy-eighth page of the Report for 1860, it will be seen that the value of the fertilizers for the two crops,—wheat in 1860, at $1.25 per bushel, and hay in 1861, at $10 per ton,—is as follows :—

Stable manure,	$25.80	per acre;	cost,	$18.00;	net gain,	$7.80 per acre.
Ground bone,	12.07	"	"	7.50	"	4.57 "
Super-phosphate,	17.73	"	"	6.25	"	11.48 "

The wheat stubble and young clover was mowed and taken off in September, 1860. The clover was mowed July 13th, and the rowen September 9th, 1861.

Statement of Albert Stratton.

Statement of the progress of the forty-five rods of land on which I made the different applications of manure last year, to a corn crop. This year ploughed once, the 18th of May, seven inches deep, harrowed well; sowed one bushel of oats on the five lots, or six and two-fifths quarts on each lot, harrowed and brushed in the seed, oats and grass; harvested August 17th with hand cradle; put in stooks one week; threshed and weighed as follows :—

No. 1,	. . .	oats, 54 lbs;	straw, 115 lbs.
2,	. . .	" 52	" 106
3,	. . .	" 50	" 104
4,	. . .	" $52\frac{1}{2}$	" 105
5,	. . .	" 44	" 91

Statement of Isaac B. Woodward.

Last year I furnished you with a statement of my experiment on the use of manures, and the result, as far as an almost total failure of the crop seemed to require. I will now state

the result of the experiment as affecting the crop of wheat this year. The lot, it will be remembered, was divided into five equal parts, each containing four square rods. The piece was ploughed twice the first week in May, 1861; the first time seven inches, and the second time six inches deep, and sown with wheat. The crop was harvested on the 16th of August, and the several lots yielded as follows:—

No. 1,	.	.	wheat, 32 lbs.	14 oz. ;	straw,	46 lbs.	7 oz.
2,	.	.	" 27	10	"	39	6
3,	.	.	" 30	14	"	44	11
4,	.	.	" 29	14	"	39	9
5,	.	.	" 23	6	"	31	12

It will be seen that the crop of No. 2, where the manure was ploughed in six inches deep, is less than that of the other manured lots. This is partly owing, I think, to the fact that about one rod of it was badly injured by worms. The weather was as follows:—

	First Third.	Second Third.	Last Third.
May, ...	wet.	dry.	wet.
June, ...	wet.	dry.	dry.
July, ...	dry.	dry.	moist.
August, ...	moist.	dry.	dry.
September, . . .	moist.	dry.	dry.

Statement of W. G. Wyman.

A statement of the continuation in 1861 of my experiment commenced in 1860, on the proper depth of applying manures, in accordance with the requirements of the Board of Agriculture.

The size of the field, one acre and thirty-two square rods; the division into lots of thirty-two rods each, and the numbers of the lots, the same as in 1860.

The field was ploughed once, about six to seven inches deep, May 1st and 2d; harrowed once; sowed May 3d, with two and one-fourth bushels of Scotch fife wheat, one-half bushel each of Timothy and redtop seed, and fifteen pounds clover; harrowed again and brushed. The grain was cradled and got into the barn without stooking, August 12th to 16th;

threshed by hand and weighed October 4th and 5th. The grain louse, *aphides*, almost covered the heads of wheat on the whole field before ripening, and caused the kernel to be very much shrivelled. The weevil, or wheat midge, also was found in all parts of the field, which ate out the centre of the kernel to a considerable extent, destroying it so that the shell of it would blow away with the chaff in winnowing. The injurious effects of these insects appeared to be pretty evenly distributed through the several lots, so that when examined, as it frequently was by myself and others, we could not see that any one lot was more seriously affected than another.

The wheat and straw weighed as follows:—

No. 1,	.	.	wheat 203 lbs.;	straw,	466 lbs.
2,	.	.	" 170	"	403
3,	.	.	" 192	"	449
4,	.	.	" 183	"	503
5,	.	.	" 62	"	255
6,	.	.	" 163	"	446

The weather during the season of growth was as follows:—

	First Third.		Middle Third.		Last Third.		Total.
		in. rain.		in. rain.		in. rain.	in. rain.
May, . .	Wet, .	2.417	Dry, .	0.430	Moist,	0.861	3.708
June, . .	Wet, .	1.778	Dry, .	0.788	No rain.		2.566
July, . .	Wet, .	2.256	Moist,	1.848	Dry, .	1.851	5.958
August, . .	Dry, .	1.330	Moist,	2.680	Dry, .	0.168	4.178
Total amount of rain that fell during the four months, . .							16.410

NORFOLK.

Statement of Charles Breck.

My experiment on manure was conducted in every respect according to the requirements of the State Board of Agriculture.

The piece of land selected as the one best adapted to the experiment was an old pasture, which had probably been used

as such fifty years or more, and, consequently, no part of it had been affected by any application of manure before the present season. It contained thirty-four rods, and was divided into nine lots; five containing four rods each for the County and State experiment, three of four rods each for trial of super-phosphate by the side of manure, and one of two rods with house ashes.

The land was of a light, loamy soil, with a gravelly sub-soil. It was ploughed between seven and eight inches deep. The result was as follows: No. 1 had 116 pounds of corn on the cob, and 118 pounds of fodder, which was at the rate of 59.48 bushels of shelled corn, and 4,720 pounds of fodder per acre. No. 2 had 128 pounds of corn on the cob, and 103 pounds of fodder, which was at the rate 65.64 bushels of shelled corn, and 4,120 pounds of fodder per acre. No. 3 had 118 pounds of corn on the cob, and 79 pounds of fodder, which was at the rate of 60.51 bushels of shelled corn, and 3,160 pounds of fodder per acre. No. 4 had 56 pounds of corn on the cob, and 42 pounds of fodder, which was at the rate of 28.71 bushels of shelled corn, and 1,680 pounds of fodder per acre. No. 5 had 23 pounds of corn on the cob, and 25 pounds of fodder, which was at the rate of 11.64 bushels of shelled corn and 1,000 pounds of fodder per acre. The quantity of manure used was an even horse-cart body full for each lot, or twenty feet, equal to six and one-fourth cords per acre. It was horse and pig manure, in which leaves had been freely used for litter. It was made the previous winter, and had been carted to the field a few weeks before using.

The average of the four lots on which manure was used was 53.73 bushels of shelled corn, and 3,420 pounds of fodder per acre, or 42.09 bushels of corn, and 2,420 pounds of fodder per acre more than on that where no manure was used.

Taking then No. 5, on which no manure was used, as the standard of what the ground would produce without manure, we have a clear gain of 42.09 bushels of corn, which at $1 per bushel is . .	$42 09
And 2,420 pounds of fodder, which at $8 per ton is .	9 68
	$51 77
From which, if we deduct the value of six and one-fourth cords of manure, at $7 per cord, . . .	$43 75
Leaves as profit which the manure brought over its cost,	$8 02

Or if we take that which appeared to be the most judicious application of the manure, we find a clear profit of $22.73 per acre.

The value of the crops on the several lots, by the above estimate, is as follows:—

On No. 1, where the manure was turned under at the first ploughing, $78.36. On No. 2, on which the manure was ploughed in at the second ploughing, $82.12. On No. 3, where the manure was cultivated in, $73.15. On No. 4, where the manure was spread upon the surface after planting, $35.43, and where there was no manure, $15.64.

The calculation of the corn was made by taking seventy-eight pounds of corn on the cob as equal to one bushel of shelled corn.

In continuation of the experiment, No. 6 had a small handful of Coe's super-phosphate in the hill before planting, which was well mixed with the soil, and also a small quantity spread upon the surface at the first hoeing, and mixed with the soil. No. 7 had the same spread upon the surface after planting, and again after the first hoeing. No. 8 had the same spread on the surface after the first, and again after the second hoeing. No. 9 had ashes spread on the surface after the first and second hoeing. The super-phosphate used was 800 pounds per acre, and the ashes, 80 bushels per acre.

No. 6 had 55 pounds of corn on the cob, and 47 pounds of fodder, which is at the rate of 28.20 bushels of shelled corn and 1,880 of fodder per acre. Nos. 7 and 8 were so nearly alike that they were harvested and weighed together. They had each 57½ pounds of corn, and 46½ pounds of fodder, at the rate of 29.84 bushels of shelled corn and 1,860 pounds of fodder per acre.

Average of Lots Nos. 6, 7 and 8,—

Corn, 29.29 bushels, value,	$29 29
Fodder, 1,866 lbs., at $8 per ton,	7 46
	$36 75
Deduct as before the produce of No. 5,	15 64
	$21 11
From which deduct the super-phosphate,	20 00
And we have as the value of the super-phosphate,	$1 11

No 9 had 19 pounds of corn on the cob, and 21 pounds of fodder, which is at the rate of 19.48 bushels of shelled corn and 1,680 pounds of fodder per acre.

Value, calculated as above, ...	$26 20
Deduct No. 5, as before, ...	15 64
	$10 56
Eighty bushels ashes, at one shilling per bushel, . . .	13 33
Which leaves No. 9 in debt at present, ...	$2 77

Thus the account stands at the present time. The past season has been a very dry one, and undoubtedly has affected the crops very much; but whether it has one kind of manure more than another, it is impossible at present to determine. I am inclined to the opinion that the super-phosphate has been affected by it more than the other manure, from the fact that in many hills of potatoes which were planted with it, it remained without much alteration at digging time; and possibly it may show itself to better advantage in the succeeding crops than it has at the present time; if so, due notice will be taken of it. One thing, however, is certain this year with me, it has not paid for using; while the other manure used, except the ashes, has paid a handsome profit in the present crop, with a fair prospect of more to follow.

The lots were all planted with yellow corn the 21st of May, and cultivated and hoed twice. It all came up very nearly the same time, and looked very much alike; but soon Nos. 2 and 3 went ahead of the rest, which continued for several weeks; then No. 1 began to go ahead, and the latter part of the season appeared to be the best, which is accounted for by the fact that there was more fodder than on either of the other lots. The last of September the corn was cut up and stacked on the adjoining land, and October 2 the piece was ploughed and sowed with rye and grass seed, which at the present time look well, and very much alike on the whole piece.

Synopsis of the Weather.

May, dry month,—good showers in each third.

June,	1st third,	moist;	2d third,	dry;	last third,	moist.		
July,	" "	dry;	" "	dry;	" "	dry.		
Aug.,	" "	dry;	" "	dry;	" "	dry.		
Sept.,	" "	dry;	" "	dry;	" "	dry.		

The average of the thermometer for May was 54.13 degrees, which was nearly two degrees less than the average of the last twelve years, and about two degrees colder than the last two years.

The average of June was 65.43 degrees, which was a little lower than the average of the last twelve years, yet a little warmer than for the last two years.

The average of July was 71.17 degrees, like June, a little lower than the average of the last twelve years, and about two and a half degrees higher than the last two years.

The average for August was 66.92 degrees, about one degree colder than the last twelve years, and three degrees colder than last year.

The average of September was 60.63 degrees, which was about two degrees colder than the last twelve years, and about one degree warmer than either of the last two years.

MILTON, November 20, 1861.

Recapitulation.

	Weight of corn on the cob.	Weight of fodder.	Bushels of shelled corn per acre.	Weight of fodder per acre.	Value of corn per acre at $1 per bush.	Value of fodder per acre at $8 per ton.	Total value per acre.
	lbs.	lbs.		lbs.			
No. 1, . . .	116	118	59.48	4,720	$59 48	$18 88	$78 36
No. 2, . . .	128	103	65.64	4,120	65 64	16 48	82 12
No. 3, . . .	118	79	60.51	3,160	60 51	12 64	73 15
No. 4, . . .	56	42	28.71	1,680	28 71	6 72	35 43
No. 5, . . .	23	25	11.64	1,000	11 64	4 00	15 64

Statement of Aaron D. Weld.

I shall confine myself to the simple statement. I selected a level piece of land from a field of six acres, containing one hundred square rods, and divided it into five equal parts of twenty square rods each.

The character of the soil is rather heavy than otherwise, loamy, dry and retentive of manure.

The last crop from the field was grass, one-half ton to the acre, having been down to grass seven years without top-dressing.

Six feet of well-rotted stable manure were applied to lots Nos. 1, 2, 3 and 4 each. No. 5 had no manure. No. 1 was spread, and the whole piece ploughed eight inches deep. No. 2 was then spread, and the whole piece cross-ploughed four inches deep. No. 3 was then spread, and the whole piece harrowed. May 16, the five lots were planted with corn in hills $3\frac{1}{2}$ feet by $2\frac{1}{2}$ feet, and the manure then spread on to lot No. 4.

The piece was cultivated and hoed June 14th and 26th.

One-third of each lot I have taken as the basis of my calculations.

September 14th the corn was cut at the butt, shocked and weighed, with the following result:—

Lot No. 1	weighed . . .	865 lbs.
2	" . . .	1,095
3	" . . .	895
4	" . . .	760
5	" . . .	580

October 1st it was husked and weighed, and a portion shelled to estimate upon, with the following result:—

	6 2-3 Rods.		20 Square Rods.			Acre.
	Actual weight in Ear.	Estimated Shelled.	Estimated in Ear.	Estimated Shelled.		Estimated Shelled.
	lbs.	lbs.	lbs.	bushels.	lbs.	bushels.
Lot No. 1. . .	230	170	690	8	30	68
2, . .	274	202	822	10	6	80.48
3, . .	253	187	759	9	21	74.48
4, . .	200	148	600	7	24	59.12
5, . .	167	123	501	6	9	49.12
Weight of Stover.	Actual weight.		Estimated.			Estimated.
Lot No. 1, . .	635 lbs.		1,905 lbs.			7.1240 tons.
2, . .	731		2,193			8.1544
3, . .	642		1,926			7.1408
4, . .	590		1,770			7.160
5, . .	413		1,239			4.1912

The whole piece was sown to winter rye and Timothy grass seed, September 20th—about five pecks of rye, and a fraction over one bushel of Timothy seed to the acre.

Synopsis of the Weather.

	First third.	Middle third.	Last third.
May, ...	moist.	dry.	moist.
June, ...	dry.	dry.	dry.
July, ...	dry.	dry.	dry.
August, ...	dry.	dry.	dry.
September, . . .	moist.	dry.	dry.

I marked off one additional Lot, which is numbered "6," and cultivated that—as is the usual practice on the farm—precisely like No. 3, except that we apply to the hills about two cords of night-soil and meadow mud well mixed, to the acre.

The result of this Lot was as follows:—

September 14th, weight of corn and stalks, Lot No. 6 weighed 840 pounds.

Weight, Husked and Shelled.

	6 2-3 Rods.		20 Square Rods.			Acre.
	Actual weight in Ear.	Estimated Shelled.	Estimated in Ear.	Estimated Shelled.		Estimated. Shelled.
	lbs.	lbs.	lbs.	bushels.	lbs.	bushels.
Lot No. 6, . .	254	187	762	9	21	74.48
Weight of Stover.	Actual weight.		Estimated.			Estimated.
Lot No. 6, . .	586 lbs.		1,758 lbs.			7.64 tons.

PLYMOUTH.

Statement of Spencer Leonard, Jr.

Having entered as a competitor for the premium offered for the best experiment in the application of manures, payable in 1860, I will give you an account of my operations.

The lot of land selected was a warm, sandy loam, of very even quality, had been in grass four years, producing about fifteen hundred pounds of hay to the acre.

May 4th, 5th and 6th, 1858, applied twelve cartloads of good manure, of thirty-eight cubic feet each, upon one-half of the acre, and ploughed the whole acre about seven inches deep; four or five days after, the same amount of manure, and of a like quality, was spread upon the other half, and the whole

well harrowed. May 15th, the corn was all planted, without any thing in the hill; the corn came up well and commenced growing, the half acre on which the manure was harrowed in soon taking the lead, and looking much the best up to about the 1st of August, when the other half acre began to gain upon it rapidly, and at the 1st of September it was evident that the half acre upon which the manure was ploughed in was equal if not superior to the other. The season has been wet, and I should judge, very favorable to the half acre upon which the manure was harrowed in.

A cultivator was passed through three times, and it was hoed twice. The corn was harvested upon the half acre upon which the manure was harrowed in, one week before it was upon the other, as the corn kept green longer upon the part where the manure was ploughed in than where it was harrowed in, and at the time of harvesting each part, as near as I could judge, was very nearly of an equal dryness. It was harvested from the 12th to the 20th of October, and weighed as follows:—

	Lbs.	Lbs.
Sound corn on half-acre, manure ploughed in, .	2,849	
Soft corn on half-acre, manure ploughed in, .	137	
		2,986
Sound corn on half-acre, manure harrowed in, .	2,787	
Soft corn on half-acre, manure harrowed in, .	111	
		2,898
Balance in favor of manure ploughed in, . .		88

1859. April 5th. Three bushels of oats were sowed upon the acre, evenly, well harrowed and rolled; the grass seed was sowed before rolling. The oats were cut July 28th and 29th, well dried, put in the barn, and threshed by a machine, September 5 and 6, and produced as follows:—

Half-acre, manure ploughed in.	*Half-acre, manure harrowed in.*
Grain, . . . 17¾ bush.	Grain, ... 17 bush.
Straw, estimated, . 1,500 lbs.	Straw, estimated, . . 1,800 lbs.
1860.—Weight of hay, . . 989 lbs.	1860.—Weight of hay, . . 1,059 lbs.
1861.—Weight of hay, . . 948 lbs.	1861.—Weight of hay, . . 775 lbs.

Value of Produce for Four Years on the half-acre, Manure Ploughed in.

1858.	2,849 lbs. of sound corn, at 1 ct. per lb.,			$28 49		
	137	soft corn,	50 cts. per cwt.,	68		
	2,166	stover,	40 cts. per cwt.,	8 66		
					$37 83	
1859.	17¾	oats,	50 cts. per bush.,	8 87		
	1,500	straw,	35 cts. per cwt.,	5 25		
					14 12	
1860.	989	hay,	$18 per ton,		8 90	
1861.	948	hay,	$15 per ton,		7 11	
	Total,					$67 96

Value of Produce for Four Years on the half-acre, Manure Harrowed in.

1858.	2,787 lbs. of sound corn, at 1 ct. per lb.,			$27 87		
	111	soft corn,	50 cts. per cwt.,	55		
	2,210	stover,	40 cts. per cwt.,	8 84		
					$37 26	
1859.	17	oats,	50 cts. per bush.,	8 50		
	1,800	straw,	35 cts. per cwt.,	6 30		
					14 80	
1860.	1,059	hay,	$18 per ton,		9 53	
1861.	775	hay,	$15 per ton,		5 81	
	Total,					$67 40
	Balance in favor of ploughing in manure,					56

Statement of Spencer Leonard, Jr.

Having entered as a competitor for the premium offered in 1860, payable in 1862, for an experiment in the application of manures, I will give you an account of the grain crop of this year.

The crop was barley, and the ground was ploughed, April 29th, about seven inches deep, but owing to wet weather the grain was not sowed until May 6th, applying two and one-half bushels to the acre. The ground was then well harrowed, and before rolling, grass seed, at the rate of ten pounds clover, eight quarts herds, and six quarts blue grass seed, was sowed. The barley came up well, but the continued wet and cold weather, for some six weeks, gave it a sickly appearance, when the sudden turn of some weeks of dry weather injured it the other way, and the result is a light crop. It was cut July 24th, and threshed out by hand August 1st, and I obtained from

Plot No. 1, ...	Grain, 1 bush.	4 qts.	weighing	46½ lbs.	Straw, 63 lbs.
2, ...	Grain, 1	9	"	53	Straw, 75
3, ...	Grain, 1	5	"	49	Straw, 64
4, ...	Grain, 1	4	"	47	Straw, 64
5, ...	Grain,	24	"	29½	Straw, 39

The weather, while the crop was in the field, was nearly as follows:—

May, 1st ten days, wet; 2d ten days, wet; last ten days, moist.
June, " " wet; " " moist; " " dry.
July, " " dry; " " dry; " " moist.

Each plot contained twelve rods of ground.

Statement of Spencer Leonard, Jr.

Having entered as a competitor for the premium offered for an application of manure, payable in 1863, I will state that the lot contains sixty rods, is a light sandy loam, has been in grass three years, producing about three-fourths of a ton of hay to the acre. It was divided into five equal parts, each two rods wide and six rods long.

May 7th, two loads, of thirty-eight cubic feet each, of good manure, was spread upon plot No. 1, and the whole lot was ploughed about seven inches deep. The same amount, and of like quality of manure, was then spread upon plot No. 2, and the whole lot was cross-ploughed about four inches deep; then the same amount was spread upon plot No. 3, and the whole well harrowed, and marked out for planting, three feet five inches apart, each way. The same amount was then spread upon plot No. 4, and May 9 the whole was planted with a medium-sized yellow corn, called in this vicinity Alden corn. A cultivator was passed through it four times, and it was hoed three times.

September 10th the corn was cut and shocked, care being taken to keep each part entirely separate; and September 13th the ground was sowed to rye. October 15 the corn was taken in and husked, and weighed as follows:—

Plot No. 1, ...	good corn, 301 lbs.	soft corn, 57 lbs.	Fodder, 274 lbs.
2, ...	good corn, 287	soft corn, 56	Fodder, 253
3, ...	good corn, 295	soft corn, 56	Fodder, 249
4, ...	good corn, 277	soft corn, 42	Fodder, 230
5, ...	good corn, 219	soft corn, 36	Fodder, 203

The weather has been nearly as follows:—

May,	first ten days,			wet;	middle ten days,			wet;	last ten days,			moist.
June,	"	"	"	wet;	"	"	"	moist;	"	"	"	dry.
July,	"	"	"	dry;	"	"	"	dry;	"	"	"	moist.
August,	"	"	"	moist;	"	"	"	moist;	"	"	"	moist.
September,	"	"	"	moist;	"	"	"	dry;	"	"	"	moist.

The corn came up well, and where the manure was put, looked well throughout the season, and produced, as you will see, at the rate of a fraction over fifty-one bushels to the acre, reckoning eighty-five pounds, on the ear, for a bushel.

Statement of Caleb Bates.

Peat Composts.—I staked out a five acre lot, on which to apply peat. On one acre I applied about two hundred loads four years ago; on another acre I put about the same last year; and finding beneficial results, on the remaining three acres I have put, this last summer, six hundred and seventy loads, putting one load in a pile, and spreading over each heap about one-third of a bushel of unleached ashes, putting on, in all, two hundred and forty bushels.

This I consider the most judicious method of composting with ashes. As it is softened by exposure it is desirable to have it in small parcels. By covering the heaps with unleached ashes the rains leach it into the peat, and then the frost, before spring, will complete the work of disintegration, and make an excellent and durable fertilizer.

When I compost peat with fœtid substances, I keep it in large piles to prevent the escape of ammonia, making the expense double in carting, over composting with ashes, as above described.

NANTUCKET.

Edward W. Gardner's Statement of the products of his Experimental Application of Manures, entered for Premium in 1860.

The whole piece of ground experimented upon in 1860, was ploughed eight inches deep on the 5th of April, 1861, and on the 9th of the same month was sowed with six quarts of spring Java

wheat, three quarts redtop, one quart Timothy, and one-half pound red clover seed, to each of the five parts. July 31st the wheat was reaped, and the products of each part were as follows, viz.:

No. 1, . . .	Wheat, $32\frac{1}{2}$ lbs.	Stover, $51\frac{1}{2}$ lbs.
2, . . .	Wheat, 28	Stover, 71
3, . . .	Wheat, 34	Stover, 103
4, . . .	Wheat, 23	Stover, $90\frac{1}{2}$
5, . . .	Wheat, 14	Stover, 19

The wheat came up thinly, and at first seemed to have good heads, but the ends were filled with lice, which did the grain much harm. Allowing sixty pounds to the bushel—

No. 1 produced, . . .	$11\frac{34}{60}$	bushels per acre.	
2 " . . .	$10\frac{2}{60}$	"	"
3 " . . .	$12\frac{12}{60}$	"	"
4 " . . .	$8\frac{15}{60}$	"	"
5 " . . .	$5\frac{1}{60}$	"	"

Weather Table, 1861.

	First third.	Middle third.	Last third.
May, ...	moist.	dry.	moist.
June, ...	moist.	dry.	dry.
July, ...	dry.	dry.	dry.
August, ...	dry.	wet.	dry.
September, . . .	dry.	moist.	dry.

Edward W. Gardner's Statement of the results of his Experimental Application of Manures, entered for Premium, in 1861.

The land selected this year, joins that experimented upon last year, and is of about the same quality, sandy loam on a subsoil of clay and gravel, rather moist, and retentive of manures. It received, last year, about thirty loads of manure to the acre, which was ploughed in eight inches deep, and was planted with corn, and produced a good crop. It measures forty-five feet by two hundred and fifty-five, and was divided into five equal parts of forty-five by fifty-one feet. April 1st,

three loads of manure from the hog-pen was put on No. 1, and the whole was ploughed eight inches deep; the same on No. 2, and the whole was ploughed four inches deep; the same on No. 3, and the whole was cultivated, harrowed, and planted with onions. No. 4 received the same amount of the same manure. The onions did not come up; and on the 23d of May it was planted with white flint corn, in hills three feet apart. The corn was cut up at the ground, September 10th, and was husked on the 20th. The products were as follows:—

No. 1, .	Corn, in the ear,	171	lbs.	Stover, 248 lbs.
2, .	Corn,	"	149½	Stover, 190
3, .	Corn,	"	158½	Stover, 261
4, .	Corn,	"	39	Stover, 71
5, .	Corn,	"	4½	Stover, 47

MUCK, AND ITS USES.

BY SANFORD HOWARD.

Perhaps some definition should be given, in the first place, of the term muck. In England it is applied to the ordinary manures of the farm; hence the adage—"Muck is the mother of money." In our country, or at least in this section, the term is commonly applied to the substance of bogs and swamps, including, in many instances, what would be called peat in other countries. It is seldom that much discrimination is used in its application, and it is therefore made to comprehend substances which differ greatly in composition and value. As a matter of course, the estimation in which farmers hold what is called muck, varies widely. One man says it is worthless, or nearly so, while another considers it of nearly equal value with farm-yard manure. This discrepancy may be accounted for in part by the difference in quality of so-called muck, in part by the manner in which it is used, and in part by the character of the soil to which it is applied.

To further illustrate the subject, we may consider the origin of the different kinds of muck. That which is most common

in this vicinity is found in bogs or swamps, which in their natural condition produce chiefly vegetation of a low order. All localities where it is found have too much water for the growth of valuable plants. Where the water is stagnant, moss is often found as the principal vegetable growth. Different species of this plant, in fact, form so large a portion of the vegetation of bogs, that in England such places are frequently called "mosses." The moss obtains a hold, shoots up a little above the water, and as it grows from year to year, the lower portion settles down and decays—forms "muck." Thus the growth continues, and the decayed substance accumulates, becoming more solid with age and pressure, till at length it acquires the character of peat—may be cut in pieces which will retain their shape when dried, and may be used for fuel. In some instances we find that after bogs have acquired a certain degree of firmness, some trees will grow on them. The cedar swamps of this section may be cited as illustrations. The larch, hemlock and pine sometimes grow in such places, but where stagnant water abounds, are stunted and small.

It is evident that muck which is formed under such circumstances cannot abound in fertilizing matter. We know that the manure which is made by animals while eating poor herbage is of inferior quality compared with that made while the animals are fed with the best grasses, green or dry; but here is a case where the vegetation is so poor that it would be rejected by animals, and the manure it would make, on decomposition, must be correspondingly low in the scale of fertilizing power. The fragments of the trees alluded to can hardly improve it, as the resinous matter they contain resists decomposition, and they form, also, tannic acid, which is injurious to vegetation.

In other cases, the substance of bogs has accumulated, and the quantity of water, from various causes, lessened, till other kinds of trees—as maple, birch and ash—take root and grow. The leaves and branches, which fall from these trees and decay, form a richer substance than that of the moss and the cedar in the former case. If, from the absence of trees, herbage plants spring up, they are of a character which indicates the improvement of the soil over that on which moss is the principal growth. Muck from such localities, especially where there is

something of a current to the water, is better than that from stagnant, moss-covered bogs. The motion of the water seems to wash out or prevent the formation of certain acids, which often lessen the value of muck.

In other localities we find something called muck, which originated in a way different from any yet noticed. I allude to the contents of basins which occur in upland woods. These receive the wash of the surrounding land, with which is mingled the leaves and branches of hard wood trees in various stages of decay. In many instances water is retained by these basins for only a portion of the year, and their contents undergo a decomposition similar to that which would take place in a farmer's barnyard or hog-pen. A kind of muck is formed in such cases, which is far superior to that from swamps and bogs. I have known cases where an application of it to land planted with corn, produced equal effects on that and the succeeding crops, with the same quantity of good barnyard manure applied under similar circumstances.

So much for the different articles called muck. Their chemical composition undoubtedly varies considerably. Johnson's Farmer's Encyclopedia gives the result of the analysis of a sample of soil from "an entirely barren peat moss," and also the result of an analysis of a sample from a "fertile moss," which are herewith appended. Two things are particularly observable in regard to these analyses, viz.: the much greater quantity of fine silicious sand in the fertile sample, and the difference in the condition of the vegetable matter, it being "inert" in the barren, and in a "decomposing" state in the fertile sample. Both lots are understood to be drained.

Sample from the barren lot.

	Parts.
Fine silicious sand,	29
Inert vegetable matter,	289
Alumina,	14
Oxide of iron,	30
Soluble vegetable matter, with some sulphate of potash,	11
Sulphate of lime, (gypsum,)	12
Loss,	15
	400

Sample from the fertile lot.

	Parts.
Fine silicious sand,	156
Unalterable vegetable fibre,	2
Decomposing vegetable fibre,	110
Silicia, (flint,)	102
Alumina, (clay,)	16
Oxide of iron,	4
Soluble vegetable and saline matter,	4
Muriate of lime,	4
Loss,	2
	400

Dana, in his Muck Manual, gives a summary of the constituents of twelve samples of muck or peat from different localities in this State, from which it appears that in regard to "soluble geine," they varied from 10.00 to 48.80, and in "salts and silicates," from 6.00 to 40.55. But he does not particularly inform us in reference to the character of the localities from which the samples were taken.

It may be remarked that deposits of muck are sometimes underlaid by marl, abounding, in many instances, with the remains of crustaceous animals. In the Hudson River Valley, and other portions of New York, and in the westerly portions of this State, as well as other sections of this country, such deposits are not rare. They are also common in England. The muck from such localities is generally rich; but where they can be drained to a sufficient depth, the marl or marly earth at the bottom affords a better soil for cultivation than the muck does. Hence, where extensive deposits of this description occur in England, the object is to get rid of the greater portion of the vegetable matter in the cheapest and most expeditious manner. In some instances this has been done by causing a stream of water to carry it away. These shell marl-beds often form the most productive and permanently fertile soils. The marl, too, frequently produces excellent effects when spread on land.

From what has already been said, it follows that the use of muck as a fertilizer should depend upon its quality, which, as has been shown, varies according to localities or the circum-

stance under which it is formed. That which consists principally of the leaves of hard wood trees (as previously described) is good manure in its crude state, though exposure to a winter's frost may improve it by pulverization, and making it more soluble by dissipating any noxious acid it may contain. But that which is taken from swamps, and especially from moss, generally requires more preparation to make it good manure. It is commonly used as an absorbent of urine and the liquids of the manure-heap. Simply as an absorbent it is valuable. Its affinity for ammonia is said to be greater than that of charcoal, which some chemists say will absorb ninety times its weight of ammoniacal gas. So far as muck is wanted merely for this purpose, it may be that the difference in its composition will not much affect its value; but as it is to be finally added to the soil, the ultimate result must of course depend on its composition.

There can be no doubt of the benefit of using muck in stables, manure-cellars and yards to such an extent as may be necessary to absorb the liquids and bring the mass of manure into a condition that will admit of its being readily carried to the field. In connection with this, another object is effected, namely: the preservation of fertilizing gases, which are to a certain degree fixed or retained by the muck.

We know that the use of muck, even for the purpose just mentioned, is objected to by some farmers. They say the poorest sand is better than any muck to mix with manure. Not having witnessed any experiments in reference to the subject, I will not venture to decide the question involved, though I cannot see how pure silicious sand can be worth much for manure. Still, I have so often heard the statement alluded to from respectable farmers, that I regard the matter as deserving investigation.

In comparing sand and muck, in regard to their value for mixing with manure, much, doubtless, depends on the character of the soil to which they are applied. Muck tends to make soil more light, and where lightness is already a defect, sand saturated with urine might be preferable to muck used in the same way, because the former would produce more compactness. It can hardly be supposed, however, that the absorbent power of sand can be equal to that of muck in proportion to weight—sand being much heavier in proportion to

its bulk, and of course more expensive to move. On a tenacious soil the muck would probably be better, on account of its producing more lightness and friability.

I am aware it is a common idea that muck is specially applicable to loose, sandy or gravelly soils. But the most beneficial effects that I have ever seen from the application of muck have been on clayey soils—the vegetable matter, on being mixed with the soil, breaking its tenacity, and keeping it sufficiently open and mellow at all times. In England the use of clay is regarded as of so much importance in bringing peat-bogs into profitable cultivation, that great expense is frequently incurred in depositing clay on the surface—the coating being sometimes three or four inches in thickness.

It is not improbable that even the poorest kind of muck, when divested of noxious principles, which, as before-mentioned, they generally contain in their crude state, may contribute to the growth of plants by affording carbonic acid. Yet we have known cases where the benefit of applying that from mossy bogs unmixed with any other substance, though well prepared by the action of the atmosphere, was not equal to the cost of digging and hauling it a few rods. The explanation is, that there was carbon enough, or nearly enough, in the soil, and that the muck was destitute of other fertilizing elements. Had there been a deficiency of carbon, the benefit from the muck would probably have been greater. But carbon is not generally a scarce element in soils.

There seems to be reason in Dr. Dana's idea that the action of alkalies is necessary in many cases to develop the fertilizing elements of muck. This is more particularly applicable to the poorer kinds of muck—such as are obtained from swamps where resinous trees grow, and from mossy bogs. This alkaline action is necessary to destroy noxious acids (acetic, tannic, &c.,) and to bring the muck into a condition in which it will decay faster, and by uniting with oxygen more readily form carbonic acid. Dr. Dana goes so far as to say that, "the power of producing alkaline action, on the insoluble geine, is alone wanted to make peat as good as cow dung," and, "by the addition of alkali to peat, it is put into the state which ammonia gives to the dung." He argues that for all agricultural purposes, carbonate of ammonia and white or soda ash, are

equal, pound for pound, and that pot and pearlashes may be taken at one-half more; that if to one hundred pounds fresh-dug peat there are added two pounds soda ash, or three pounds of pot or pearlashes, all the good effects of cow-dung will be produced. Following out the calculation, he prescribes for every cord of fresh dug peat, ninety-two pounds of pot or pearlashes, sixty-one pounds of soda, or sixteen to twenty bushels of common house or wood ashes. Dr. Dana mentions a case which throws some light on the principles laid down. It is as follows:—

"Mr. George Robbins of Watertown, an extensive manufacturer of soap and candles and of starch, employs the refuse of these trades in enriching his land. It is believed his crops will compare with those of any of the best cultivators around him. He has not used for four years (from 1851 to 1855) a spoonful of manure made by any animal walking either on two legs or four. He keeps a large number of horses and hogs, and several cows, and uses not a shovelful of their manure, but, selling that, uses peat and swamp muck mixed with his spent barilla ashes. The proportions are one part of spent ashes to three of peat, dug in the fall, mixed in the spring. After shovelling it over two or three times, it is spread and ploughed in. The effect is immediate, and so far lasting."

The preference which Dr. Dana gives to wood ashes or potash, in preparing muck for manure, seems to be justified by practical trials. The experience of Artemas Newell, Esq., of Needham, may be referred to as an example. He has used muck very extensively as an absorbent of the liquids of his horse and cattle stables, pig pens, &c., from which great benefit has undoubtedly been derived, and he has also tried it in combination with potash. In regard to the latter mode of preparing and using it, he has kindly furnished the following account:—

"The muck should be dug from its bed late in autumn, and be fully exposed to the frosts of winter before it is used. The reason why I prefer to have it dug at this season is, that if dug earlier and left on dry land, it sometimes becomes hard, like dry peat, and is, in fact, better for fuel than for manure. I deem it a waste of labor and money to use it in combination with potash or alkalies in any other form until it has been thus exposed and prepared.

"My method of combining the potash with the muck is, first to prepare a pile of muck, measure it, and make it into an oblong basin, the sides and bottom of which are as nearly as possible of the same thickness. I place a half-hogshead tub by the side of the basin, and fill it nearly full of water; then weigh and put into it thirty-five pounds of potash for each cord (or 128 cubic feet) of muck in the pile. When dissolved, the solution is dipped into the basin, and the muck from the outside of the basin is gradually thrown in as fast as it becomes saturated. After the liquid has all disappeared, the pile should be carefully worked over, and should remain a day or two, or more if convenient, and then be worked over again, when it may be used without delay. The potash I used was of an inferior quality, and cost about three and a half cents per pound.

"I used muck as above prepared on an old pasture, which was planted the last of May, 1860. A shovelful of muck was applied to each hill—the hills being at the rate of 4,500 to the acre. The lot was planted to corn the first and second days of June. It was the large and *late* variety known as the 'smutty white.' The result was a success, as I considered it, though the corn was not planted till the time of hoeing my other fields, and yet was the *only* corn I had that year that ripened sufficiently for seed. A portion of it was gathered before the 24th of September. The stalks were well grown, and the yield of grain above an average.

"To me, since I have known how to prepare it, peat muck is invaluable. In the compost heap, in hog pens, cow stalls, and in its combinations with potash, soda-ash, guano, &c., it is in daily demand."

INDIAN CORN.

MIDDLESEX NORTH.

From the Report of the Committee.

The committee appointed to award premiums on corn have attended to that duty, and respectfully submit the following report:—

There were five pieces of corn entered for premium—two in Dracut, two in Chelmsford, and one in Westford. Two of the pieces only, though large, had the required number of bushels per acre, and to these the two first premiums were awarded. These crops grew on the intervale land of the Merrimack River, which has ever been considered as peculiarly adapted to the growth of corn, from its friability, fineness after working, and its little liability to suffer either from drought or too much water.

Statement of R. W. Sawyer.

The corn I offer for premium grew on a loamy soil, or common intervale land. Last year I cut the grass the last week in June, and sowed it with buckwheat the first week in July, without manure. The piece contains about one acre; ploughed it the first day of May; spread on twenty-six cart-loads of stable manure per acre; ploughed it the second time; harrowed it down and furrowed the same, and planted it with one load of night-soil, composted with sand in the hill. Planted the 11th and 12th of May, three and a half by two feet apart.

EXPENSE OF HALF AN ACRE.

Ploughing,	$1 00
Carting and spreading manure,	2 00
Furrowing and harrowing,	1 00
Planting,	50
Hoeing, three times,	1 00
Half of stable manure and half of compost.	15 00
	$20 50

Dracut, September 8, 1861.

Mr. Sawyer planted the eight-rowed yellow corn, mixed with a twelve-rowed kind, for the purpose of improving the smaller by an admixture of the larger, and for the purpose of hastening the maturity of the large kind, but the two kinds are too far separated yet to show what the result will be. The cultivator was used between the rows, and the corn hilled after the fashion of the fathers.

Statement of Henry Smith.

The ground was in grass, and had been in grass for six or seven years, and was very much run out, producing not more than fifteen hundred of hay to the acre. Ploughed about the 2d of May; planted the 25th; land valued at $100 per acre; planted the eight-rowed common corn, two and a half acres in the piece; spread on ten and a half cords of manure, and harrowed it in; cultivated one way the first time hoeing; the second time, cultivated both ways and hoed as usual.

EXPENSE OF AN ACRE.

Ploughing,	$3 20
Harrowing,	75
Putting the manure on, and spreading,	1 00
Planting,	1 00
Cultivating and hoeing, first time,	1 75
" " " second time,	1 50
Cost of ten and a half cords of manure,	21 00
	$30 20

CHELMSFORD, September 7, 1861.

This piece exhibited a perfect swamp of stover, well set with large and long ears of fine, yellow, eight-rowed corn, with broad and deep kernels, name not known to Mr. Smith. It was planted in hills three and a half by three and a half feet and hilled.

At this time there are many kinds of corn, from which the careful farmer may select seed adapted to his soil, location, and means of feeding the crop. If his soil is warm, dry, strong and deep, the large and later maturing kinds may be used: but if thin and cold, the early and smaller kinds should be planted. When this crop has been planted in one place for a series of years, and highly manured, it has a tendency to increase its stover at the expense of the grain; the stocks growing coarse, and the ears setting high, the whole requiring large supplies of fertilizers to carry and mature the crop in our short seasons; hence the necessity of changing the seed as often as is necessary. This result may in some measure be avoided by selecting the earliest maturing ears from year to year: but many of us neglect this method of keeping our corn from

growing late in ripening. Early maturity is quite an object in this climate. Notwithstanding the cold and backward spring, and the discouraging appearance of our corn even into July, the crop was seldom better, through the wonderfully favorable weather of this fall; had the frost come upon us at the usual time, it must have been a failure. This king of our native cereals is worthy of our best attention, and cultivation. No single plant has so great a breadth of climate in which it will grow in some of its varieties—it being grown from forty-five degrees north well down to the Equator, and east and west from ocean to ocean; none enters so largely into the consumption of man and animal, making glad the stomachs of millions of living beings. The product of this plant is enormous, amounting in 1859 to nine hundred millions of bushels, an amount that the human mind can hardly grasp or comprehend. An over-production of this grain is not to be feared, since its value is becoming appreciated in Europe. Let experiments decide upon the best mode of producing this grain. How shall it be managed to secure the best results? Shall it be planted in hills and hilled up, as did the Indians, or should it be worked level, as a few have ventured to? Shall the manure be turned beneath the furrow, or shall it be worked in with the harrow? Shall it be used fresh and warm, or fermented and fine? There are advocates for all these ways; let them communicate results. Farmers, visit your neighbors' farms; there are many facts lying about that will never reach you through the agricultural journals, for their editors seldom visit the small farmers, who can work out a theory of their own to a successful result, but yet would shrink from committing their views to paper, and thus bring them before the public. There are not many who will not talk with their neighbors about the management of their crops in a quiet way; and then, again, you have the evidence of your own eyes, and need not be afraid of book-farming, as some yet are. Finally, gain all the information you can by reading, observation, and conversation: then by persevering, energetic labor, accompanied by the use of all the fertilizers within your means, you will be rewarded with an abundant crop.

LUTHER BUTTERFIELD, *Chairman.*

NANTUCKET.

Statement of E. W. Gardner.

The acre of land which I selected for an experimental crop of corn, and entered for premium, is at Cambridge, west of the barn. It is composed of sand and gravel, and is worth $10 per acre. It has been in grass seven or eight years, without any manure, and last year did not produce five hundred pounds of hay. It was ploughed eight inches deep, and harrowed on the 2d and planted on the 6th of May, with Nantucket corn, five kernels in a hill, and occasionally a pumpkin seed. The hills were three feet apart each way, and received twenty-four horse-cart loads of manure from the barn cellar. On the 8th of June, it was cultivated and hoed, and again on the 26th. On July 23d it was hoed, and French turnip seed planted in the hills where the corn was missing. The top stalks were cut September 23d, and weighed and put into the barn October 26th. The corn was cut up October 30th, and husked. November 6th, fifty pounds of ears were shelled, and produced thirty-eight pounds of corn, and twelve pounds of cob.

The cost of cultivation, and the products and their valuation, were as follows, viz.:—

VALUE OF CROP.

1,160	pounds top stalks,	$5 80
2,365	" husks, &c.,	11 82
2,948	" or 40 bushels of corn,	32 00
101	" hog corn,	50
2	cartloads pumpkins,	5 00
1	cartload turnips,	2 50
Manure in the ground,		4 00
		$61 62

EXPENSE OF CROP.

Ploughing and harrowing,	$3 00
40 hours' labor for one man, and 16 hours' labor for one horse, manuring and planting,	3 92
24 loads of manure,	12 00
17 quarts seed,	60
Cultivating and hoeing,	6 00

Cutting the stalks and binding,	$1 10	
Cutting and carting the corn,	1 50	
Husking and weighing,	2 00	
Interest on land,	60	
		$30 72
Net profit,		$30 90

Statement of Allen Smith.

The acre of corn entered by me for premium, is a part of three and one-half acres. The soil is a black, sandy loam generally, and a part of it mixture of gravel. The condition of the land was poor. It was sowed down to grass in the spring of 1856, and has had no manure since until last winter (1860). I applied thirty-five loads of barn manure, each load containing about twenty bushels. It was ploughed the last of April, seven inches deep, and planted the 1st of May, three feet apart one way by two feet the other. I applied about three hundred gallons of liquid manure in the hills. For some reason unaccounted for, not more than one-fourth part came up. The seed was native corn. It looked well, but I have since thought that it was injured by the early frost of 1860. It was planted over the last of May, and came up well, but did not do so well as that which came up the first planting. It was cultivated and hoed three times, and I should have hoed it the fourth time had it not been for the army worm, which made its appearance about the last of July; and as there was considerable dog's grass among the corn, I thought they would feed on that instead of the corn. Fortunately they did but little damage to it, although some pieces were wholly destroyed by them. The stalks were cut and stooked on the same day in the second week of September; in about twelve days they were taken to the barn. On the 22d of October commenced harvesting. The result is as follows:—

VALUE OF CROP.

4,640 pounds ears good corn, equal to 58 bushels shelled corn, worth 80 cents per bushel,	$46 40
3,118 pounds stalks, at $10 per ton,	17 59
2 tons butts and husks, worth $5 per ton,	10 00
400 pounds pig corn,	2 00
	$75 99

EXPENSE OF CROP.

Interest and taxes on land,	$4 00	
38 loads manure, at 50 cents,	19 00	
Ploughing and harrowing,	4 50	
Cultivating and hoeing,	6 00	
Cutting stalks,	2 00	
Harvesting and weighing crop,	5 00	
		$40 50
Net profit,		$35 49

SMALL GRAINS.

MIDDLESEX NORTH.

From the Report of the Committee.

The value to our country of the smaller grains, especially wheat, can scarcely be overestimated; and in New England, where its cultivation is just now claiming attention, any information upon the *modes* of cultivation is eagerly received. Its importance to those farmers who carry on a system of mixed farming, and who to a great extent wish to raise their own bread-stuffs, is very great. With this end in view, our agricultural societies offer quite large premiums to the most successful in its culture.

We are sorry that competitors have not given a more detailed account of their manner and expense of cultivation, as we think such information justly due the community who are interested.

Mr. Coburn's land was evidently in very fine condition; made so by previous cultivation and high manuring. This mode of cultivation the English farmers learned long ago, and we hope the American farmer is beginning to wake up to its importance.

It is a fact, we believe, that the constituents of our soils are not unlike the great grain-bearing soils of the West. The only difference being the fineness of the particles of matter composing the latter. Hence the importance of thorough pulverization. After applying the manure, let the plough, harrow, or cultivator be used until the land is in the best possible condition. We

believe neglect of thorough preparation of the soil one of the greatest causes of failure.

The seed by the best of cultivators is carefully cleansed by washing previous to sowing. The amount sown per acre varies from one to two bushels. The time of sowing winter wheat should be as early as the last of August, or the first of September. If spring wheat, it should be sown as early as possible, in order to its maturing before the appearance of insects, which prove detrimental to a full yield, and sometimes, as when weevil attacks it, entirely destroying the crop.

During the past year, a new enemy has appeared in the grain aphis or louse, proving itself a pest of a very dangerous character, especially to late sown grain. It does not eat the kernel, but seems to live upon the juices which go to its full development, leaving it small and shrivelled. Whether this insect will continue its ravages in future, it is impossible to predict. It is hoped, however, the evil will be temporary.

We have not designed to write an extended essay, wishing only to call attention to the most important facts, although in themselves "nothing new," which may result in more careful experiment in the cultivation of this important grain.

ANDREW SPALDING, *Chairman.*

Statement of J. B. V. Colburn.

The half acre of wheat which I enter for premium was grown on land near the river, rather light soil and sandy subsoil. Last year I raised a very large crop of rye from the same ground, cultivated very much the same as the wheat, viz.: About the middle of September, 1860, I ploughed in the stubble, spread on five cords of night-soil to the acre, harrowed, and sowed about one and a half bushels of wheat to the acre, harrowed twice and rolled.

Expense of cultivation, ...	$3 00
" manure, ...	12 00
	$15 00

There were eighteen bushels and twenty quarts on the half acre.

DRACUT, September 9, 1861.

Statement of Lorenzo Phelps.

The wheat which I enter for premium grew on a light, sandy soil, with a gravelly subsoil. The land is situated in Lowell, near the old Middlesex canal, and east of the road leading to Chelmsford. The piece from which the half acre is taken contains about three-fourths of an acre, with one bushel's sowing. The wheat is the white bald winter wheat, and was sowed the middle of September last without manuring. The land was broken up in the spring of 1859, and planted with potatoes that and the following year, with one shovelful of horse manure and a little lime to the hill. After the potatoes were off, the land was ploughed deep and fine, and wheat sowed on the furrow.

Expense per half acre :—

Ploughing, ...	$1 00
Two-thirds bushel of seed, at $2.50, ...	1 66⅔
Sowing, ...	25
Harrowing and rolling, ...	75
	$3 66⅔

The whole weight of wheat on the half acre was 765¼ pounds. Weight per bushel, 61 pounds, 3 ounces.

Lowell, July 26, 1861.

NANTUCKET.

Statement of Allen Smith.

Having entered as a competitor for the premium for the best acre of wheat, I will state that the soil is a sandy loam, and has been planted to corn two years. Last year (1860) it produced about thirty bushels per acre. Last winter I applied fifteen loads of liquid night-soil to this acre, each load containing one hundred and twenty gallons. I ploughed the 1st of March, and on the 30th sowed one and a half bushels of wheat soaked in brine. Harvested the 3d and threshed the 12th of August, and the yield was 1,260 pounds, or twenty-one bushels of good wheat.

VALUE OF CROP.

21 bushels of wheat, at $1.75 per bushel,		$36 75
1,600 pounds straw, at $8 per ton,		6 40
		$43 15

EXPENSE OF CROP.

Ploughing,	$2 50	
1½ bushels wheat,	3 00	
Sowing and harrowing,	1 00	
Cradling,	1 00	
Binding and carting,	1 25	
Threshing, at 25 cents per bushel,	5 25	
Interest on land, $50 per acre,	3 00	
Taxes,	50	
		17 50
Net profit,		$25 65

STOCK.

MIDDLESEX NORTH.

From the Report of the Committee on Milch Cows.

When we know of a desirable result being obtained in any course of treatment, all desire to know *how* it was done. The public gain little benefit from any great individual success in one branch of farming unless they can know the particulars of the experiment. It is of little consequence to simply *know* the fact that a great crop has been raised upon a particular piece of ground; but when we are told the kind of soil, the depth of ploughing, kind of seed used, amount and kind of manure, number of times hoed, &c., &c., then *we* may try to do as well.

We find that cows by changing owners often improve their product of milk and their condition, so that a very ordinary animal becomes noted. If we can know what peculiar management she received at the hands of the second owner, then we may keep our ordinary cows, and, in the course of time, greatly increase their value, and have the profit in our own pockets, instead of turning it over to another.

KEEPING OF COWS.—We consider that the cow that goes through the summer on the same pasture, with no extra feed, is more valuable than one that is fed extra, yet gives no greater amount of milk or butter than the first, or not enough greater to equal the value of the feed.

We would not be understood to recommend farmers not to feed extra; by no means; on the contrary, we wish all owners of cows would so feed and care for them that their milk product should be kept at the highest point consistent with the health and thrift of the animal.

There are times in the season when all cows fall off rapidly, unless a good deal of precaution is used, and after this shrinkage it is almost impossible to bring them up to their former quantity.

Exposure through a whole day to a cold rain storm is one of those periods. People seem to think that cattle must remain out all day because it is customary to keep them in the pasture in summer; that "putting up" would make them tender—not, however, fearing any bad results to themselves as they put on a thick coat and draw around the fire, while the cows stand curled and shivering, refusing to feed or be comforted, except by the warm shelter of the barn.

Many farmers do not realize how rapidly the grass in pastures is consumed. When the growth is checked by a drouth, the cows soon find very "poor picking;" yet how steadily they will work all the "livelong day," seeking out and cropping the little green patches here and there to be seen among the rocks, bushes, and parched June grass, which are the chief products of our pastures during a dry time. The cows seem to have a kind of ambition to bring up at night their usual bountiful supply of delicious milk, but how often is the amount of material insufficient to produce a generous yield. Day by day they grow thinner in flesh, showing that a severe draft upon the system is going on, and every night they look most beseechingly to their owner for a morsel of green fodder or hay to supply the demands of nature.

Will you blame them if, in this emergency, they break down a strip of rotten fence while reaching to obtain a fresh bite of luscious grass, or even jump over a poor old wall which has sunk into the ground fully one-third of its original height of

three feet and a half? Or will you give them the credit of having your best interests at heart, and of only striving to atone for your neglect by trying to keep themselves in tolerable condition?

Time of Calving.—The committee also think it is very important to know the time of calving, and when the cow will come in again. It is a well known fact, that most cows fall off in quantity of milk after being covered by the bull, and many are rendered almost valueless by nearly drying up after generation takes place.

A cow calving in February, for instance, and due to come in the February following, is deserving more credit, for an equal quantity of milk, with the same feed, than one that calved in May and is not due to come in until the following May.

Size of Cows.—The size of cows must also be considered. The general opinion is, that the larger the animal the greater the cost of keeping; but there are many exceptions to this rule. We have known small cows that consumed more food, did not keep in so good condition, and gave less milk, than quite large ones kept in the same stable upon the same kind of food. So far as profit is concerned, the larger the cow, with a corresponding increase in the milk product and cost of keeping, the better property she is; more valuable, in proportion, to sell for the dairy or for beef.

If two large cows will give as much milk as three small ones, the *care* of them takes less time, they occupy less space in the stable, and may at any time be more readily sold. We do not wish to encourage the raising of a race of huge, overgrown cows; but we think animals of good size more desirable, as a general rule, and we know that a good deal of attention is paid to this quality by those who keep large dairies and who have been successful in the business.

Treatment of Milch Cows.—The man that abuses his cows, or permits others to do it, most surely "scattereth abroad." He does that which a long course of kind treatment will not make good.

The cow should have the most gentle and reasonable management at all times. Her course of life should be like the quiet flow of a smooth and placid river, the even tenor of its

way only disturbed by the changes and manipulations necessary for the happiness and comfort of the animal.

If we were to look through the stables in our vicinity, how many instances of cruel abuse would there be found. See a stalwart man sit down beside a cow to draw the lacteal treasure; he takes hold of the teats with as little care as though they were two sticks; his calloused hands press hard upon a tender spot, the cow kicks—nobody is hurt, and the creature has only obeyed the impulse of nature and tried to rid herself of that which is causing pain. Soothe her with kind words and gentle strokes, and take hold with more care, and all will be well. But no, she has roused a tiger: up springs the man,—the heavy stool is used as a cudgel, and the cow is terribly mauled and beaten; stout cowhide boots are driven with great force against her legs and thighs, and imprecations are hurled upon the head of the devoted beast. All this time the cow is securely tied, and cannot get away from her tormentor. He again sits down to commence milking; she is frightened, excited, and trembling; her eyes protrude, her nostrils are dilated, and she groans with pain. Will you wonder that no milk is to be had; that she "holds it up"? Will you blame her if she occasionally directs a well-aimed blow at this *gallant brave* as he passes her stall, or if, after such a heartless onset, she permits the fountains of her milk to dry up, and her master to strip often and long for a scanty recompense?

We can barely touch upon some points upon which there is much to be said, and, although a great deal has been found out that is valuable about cows, more may yet be learned by close observation on our own part, and by reading the history of the experiments of others.

Let us have cows that will combine good size, good quantity and quality of milk, and good condition. Let us not keep, year after year, those that never give much milk, nor give "that little long;" but as soon as their poor qualities are known, turn them for beef, and fill their places with thrifty, thorough cows that will pay a round profit.

A herd of well-selected and well-cared-for cows is a mine of wealth to the farmer, as well as a source of laudable pride and pleasure. On the contrary, a number of half-starved, ill-treated, thriftless animals are a nuisance and a disgrace.

In conclusion, we will say that we think the society does well to offer so many premiums for milch cows. It will tend to promote this most important branch of farming; and, in doing this, will accomplish another good, viz.: tend to alleviate much want and suffering among the most valuable of our domestic animals.

JAMES T. BURNAP, *Chairman.*

Statement of Abiel Rolfe.

I offer for premium my cow, half Alderney, the other part supposed to be native breed; age, 4 years last May; calved the last of last May; kept in a common pasture that has suffered much by the drought for the last three or four weeks; never had a pound of extra feed; stabled nights, but not fed at all. Second week in June she gave $154\frac{1}{2}$ quarts of milk, weighing $327\frac{1}{2}$ pounds, from which we made $16\frac{1}{4}$ pounds butter. First week in September she gave $87\frac{1}{2}$ quarts, weighing 219 pounds, yielding $10\frac{1}{2}$ pounds butter. The falling off in milk is attributed to the grass drying up, and scantiness of water in the pasture.

LOWELL, September 12, 1861.

Statement of S. P. Perham.

The brindle cow I offer for premium is of native breed, and five years old. She was kept last winter on meadow hay and corn fodder. In March gave her better hay. Calved April, 1861, and is to calve March, 1862. No meal through the summer until within one month, when I have given her one quart per day. Milk given first week in June, 110 quarts, making $15\frac{74}{100}$ quarts per day; pounds in the same time, 244; pounds per day, $34\frac{3}{4}$. Milk given first week in September, $76\frac{3}{4}$, or $10\frac{97}{100}$ quarts per day; pounds in same time, 161; average $25\frac{3}{4}$ per day.

CHELMSFORD, September 11, 1861.

Statement of P. D. and T. S. Edmands.

The native cow which we offer for premium and exhibition is ten years old; was raised by us from a cow which we purchased of the late Deacon Goding, of Lowell, in 1847. We received the third premium on this cow of our society in 1858. She

dropped her calf on the tenth of last month. We have measured and weighed her milk the last week in August and the first week of September. We used the old measure. The result is as follows:—

DATES.	MORNING.		EVENING.		DATES.	MORNING.		EVENING.	
	Quarts.	Pounds.	Quarts.	Pounds.		Quarts.	Pounds.	Quarts.	Pounds.
Aug. 25,	7	19	7	19	Sept. 1,	$6\frac{3}{4}$	$18\frac{1}{2}$	$7\frac{1}{2}$	21
26,	$7\frac{1}{2}$	$20\frac{1}{2}$	$6\frac{1}{2}$	$17\frac{1}{2}$	2,	$7\frac{3}{4}$	21	$6\frac{7}{8}$	$18\frac{1}{2}$
27,	$7\frac{1}{4}$	$19\frac{1}{2}$	$6\frac{1}{2}$	$17\frac{1}{2}$	3,	$6\frac{1}{2}$	18	$6\frac{1}{4}$	$17\frac{1}{2}$
28,	$7\frac{1}{2}$	$20\frac{1}{2}$	$7\frac{3}{8}$	20	4,	7	$19\frac{1}{2}$	$6\frac{1}{2}$	18
29,	$7\frac{3}{4}$	21	7	$19\frac{1}{2}$	5,	$6\frac{1}{4}$	$17\frac{1}{2}$	$6\frac{7}{8}$	19
30,	$7\frac{1}{2}$	$20\frac{1}{2}$	$6\frac{1}{2}$	18	6,	$6\frac{3}{4}$	19	$8\frac{1}{8}$	22
31,	$7\frac{3}{4}$	21	7	$19\frac{1}{2}$	7,	$7\frac{3}{8}$	$20\frac{1}{2}$	$6\frac{5}{8}$	$18\frac{1}{2}$
	$52\frac{1}{4}$	142	$47\frac{7}{8}$ $52\frac{1}{4}$	131 142		$48\frac{5}{8}$	134	$48\frac{6}{8}$ $48\frac{5}{8}$	$134\frac{1}{2}$ 134
Amount for the week,			$100\frac{1}{8}$	273	Amount for the week,			$97\frac{3}{8}$	$268\frac{1}{2}$

During the last four weeks the cow has had fall feed and cow corn, without any grain or meal. Last winter she was kept on corn stover, meadow hay and turnips. Was pastured out a few weeks, the former part of the season, in this town.

For the committee,

JAMES T. BURNAP, *Chairman.*

CHELMSFORD, September 11, 1861.

WORCESTER.

From the Report of the Committee on Stock.

What constitutes the best cow? Among the Durhams the exhibition of to-day has presented us with two classes; one, with evident strong tendency to lay on fat; the other just as strongly indicative of milking capacity.

In some uncertainty as to the precise intention of the society, the committee, where they have been able to agree in conclusion, have awarded the premiums to the animal which, in their judgment, was the "best Durham;" not wishing thereby to be understood as adjudging the successful animal to be the Durham cow, or bull, *best* for the farmers of this county. Indeed, if the necessity had been imposed of determining superiority by reference to the wants of the farmers of the county singly, it is not too much to say, that in some instances, the unsuccessful animals would have become the successful ones. A cow is of little value *here*, regarded merely in the light of her capacity for beef.

The Durhams, or more technically, the improved Short-horn, are remarkable indeed for their propensity to lay on fat, as well as for their early maturity; yet, notwithstanding their rapid growth, and large size, it is doubtful whether our farmers will find proper remuneration from their breeding. Of what value to *us* is that breed of cattle, which, for nearly a century has been bred with a view solely to its fattening properties. What farmer have we, who would buy, or would not weed out of his herd, if he possessed it, an animal whose greatest yield of milk, in her period of greatest flow, was but six or eight quarts daily. Not that such a cow might not have qualities, which, in other climates, under different circumstances, would render her of great value, but that to us farmers of Worcester County, she would be comparatively valueless. For with the cheap and rapid means of transport at his command, the Western grazier possesses advantages in supplying the demand for beef, wherever existing, against which our farmers cannot successfully contend. Nor is the question to be decided by reference to this point merely. Our farms are encumbered with boulders and rocks; are hilly and stubborn under the plough, not adapted as are the fields of other regions to cultivation by horse labor. To a large extent we are and must ever be, dependent upon the slow and patient ox. But we want *activity* here, and we can only obtain it from the animal of comparatively small size, with close knit joints, compact frame, clean limb and high spirit.

But do the committee discourage the breeding of Durham cattle? So far from it, they earnestly recommend a close discrimination between the different families of this breed; and

advise our farmers never to purchase or breed from a Short-horn, the ancestors of which have not been noted for their milking properties.

Mr. Bates, one of the most distinguished breeders of Short-horns in the kingdom, and a successful prize winner for his stock, gave me, say Mr. Colman, as his opinion, that there were two lines of the Short-horns,—the one large milkers, the other different.

Loudon says, page 964:—

"The Short-horned, sometimes called the Dutch breed, is known by a variety of names, taken from the districts where they form the principal cattle stock, or where most attention has been paid to their improvement; thus different families of this race are distinguished by the names of the Holderness, the Teeswater, the Yorkshire, Durham, Northumberland and other breeds. The Teeswater breed, a variety of Short-horns, established on the banks of the Tees, at the head of the vale of York, is at present in the highest estimation, and is alleged to be the true Yorkshire Short-horned breed.

"The bone, head and neck of these cattle are fine, the hide is very thin, the chine full, the loin broad, the carcass throughout large and well fashioned, and the flesh and fatting quality equal, or perhaps superior to those of any other large breed. The Short-horns give a greater quantity of milk than any other cattle; a cow usually yielding twenty-four quarts of milk per day, making three firkins of butter during the grass season."

The same writer says:—

"The objects to be kept in view in breeding cattle, are a form well adapted to fatten; well adapted for producing milk, or for labor. These three objects have each of them engaged the attention of British agriculturists; but experience has not hitherto justified the expectation that has been entertained of combining all these desirable properties in an eminent degree, in the same race. That form which indicates the property of yielding the most milk, differs materially from that which we know from experience to be combined with early maturity and the most valuable carcass; and the breeds which we understand to give the greatest weight of meat for the food they consume, and to contain the least proportion of offal, are not those which possess in the highest degree, the strength and activity required in beasts of labor. *A disposition to fatten, and a tendency to yield a large quantity of milk* CANNOT BE COMBINED. The form of the animal most remarkable for the first is very different from that of the other; in place of being flat in the sides

and big in the belly, as all great milkers are, it is high-sided and light-bellied; in a word, the body of the animal well adapted to fatten is barrel-formed, while that of the milker is widest downwards. It is not probable therefore that the properties of two breeds of cattle of opposite form and general appearance can ever be united in the same animal."

Youatt states that

"From the earliest periods of which we have any accounts of our breeds of cattle, the counties of Durham and York have been celebrated for their Short-horns, but principally, in the first instance, on account of their reputation as extraordinary milkers. The cattle so distinguished were always as now very different from the improved race. As milkers, they were most excellent, but when put to fatten, as the foregoing description will indicate, were found close feeders, producing an inferior quality of meat, not marbled or mixed as to fat or lean, and in some cases the latter was found of a particularly dark hue."

Does not the Worcester County farmer realize the truth of this description in the descendants of Holderness?

"The improvement in the carcass of the Short-horns has been so surprising and so greatly valued, that many persons have allowed that completely to occupy their attention, and the dairy has been disregarded. In such a state of things every advance towards one point has been tantamount towards receding from another; because the same proceeding which tends to enhance a particular quality, will also enhance a defect, provided such defect was of previous existence."

"Thus far Mr. Berry, whose admirable account, says Youatt, of the improved Short-horn cattle, our readers will duly estimate. There is no point which he has more triumphantly illustrated, than the value of this breed as containing a combination of perfections. It was a point which was in a measure lost sight of by the early improvers. They developed the aptitude to fatten, and the early maturity of the Short-horns—but they neglected and were beginning to lose their milking properties. This is also the grand error of the modern breeders, and hence arose the general impression, and founded on careful observation, that in proportion as the grazing properties of the beast were increased, its value for the dairy was proportionably diminished."

Mr. Colman, than whom no better authority can be found, in his agricultural tour, says:—

"The best of these animals, however, have a strong natural tendency to keep fat; but they are not suited to a short pasture or scanty manger.

It will, I think, not be denied that they are great consumers. The high-bred animals are not remarkable for their milking properties. There are exceptions, but most of these animals are inferior in the quantity and quality of the milk. *The finest herd of Short-horn which met my observation, I found in Lincolnshire.* THEY WERE NOT IN THE HERD BOOK, BUT HAD BEEN IN POSSESSION OF THE FAMILY MORE THAN FIFTY YEARS. A superior lot of cows in appearance and condition, I never saw, nor expect to see, but they were not distinguished for their milking properties. The property to take on fat is considered inconsistent with that of large secretions of milk. This is not without exceptions within my own knowledge, but is generally true. The beef of the Short-horns, though good, is not considered of the highest quality, partly ascribed to the early age at which they are killed."

Has not the remark, made so many years ago, been verified by the experience of our own time, that in developing the aptitude to fatten which distinguishes the Short-horn, the milking properties of the breed which were then diminishing have now measurably been lost. No stronger confirmation of its accuracy could be furnished, than the improved Short-horn of to-day's exhibition affords. Animals were presented to us, farmers of Worcester County, for our approval, nearly perfect in form, challenging our admiration for their beauty, eliciting our warmest praise as specimens of an early maturing, easily fattening race. But where is the milking development? *Neglected till it has been almost lost.*

"If I wanted milk, I should prefer such a cow!" "If I lived among the blue grass pastures of Kentucky, I should breed to such a bull," were remarks made in the hearing of the committee. Most agreeing that in their opinion, A.'s animal was the best, taking into account her milking properties, and yet not quite ready to determine it to be the best Durham.

What course is to be adopted by this society for the future? Shall we recognize no animal as thorough-bred, whose pedigree is not found in the herd-book? Are there any descendants among us from that herd of Lincolnshire Short-horns, the finest Mr. Colman saw in England—bred in the same family for fifty years, yet never registered in the herd-book? If we require a pedigree in the English herd-book, shall we also require it to be traced in the American? If so, where are our Devons? It is stated on the authority of the late Mr. Phinney, that the beau-

tiful animals of this breed, imported by the Massachusetts Society for Promoting Agriculture, possessed no pedigree; that they were purchased of the most eminent breeder of this stock in England, by competent judges, without regard to cost, and that no pedigree was asked for or given. This society would hardly exclude Roebuck from competition for its prizes, notwithstanding he was not to be traced through a long line of ancestors in the genealogical tree of the North Devons.

One of the most beautiful Durham cows examined by the committee, with a pedigree as long as the tail of a comet of the first magnitude, and of purity equal to the unspotted snow, showed to the practiced eye the unmistakable signs of an Ayrshire cross upon some perhaps far removed ancestor. No member of the committee doubted, or could doubt the existence of a taint in her blood, judging from appearances. Yet the herald's office of the Durhams disclosed no *bar sinister*, and she is written down thorough-bred. Then there is the question of the identity of the animal exhibited, with the animal registered in the book,—what evidence is there of that? Clearly, the statement of the competitor, and that alone. If then such statement as to identity is satisfactory, shall it be satisfactory as to purity of blood? For there is no authorized American herd-book, and if there was, it would prove only, that the animal whose pedigree was therein recorded was thorough-bred; *not* that the animal not named therein was *not* thorough-bred.

Above all, and more than all this. For more than fifty years our enterprising farmers have had the benefit of the services of as fine animals as good judgment could select and money could purchase, till it can with truth be said, that there is hardly a cow in the county but has in her veins a strain of the best blood of some one of the best breeds in Europe.

What herald's college can furnish a better pedigree for a working ox, than the breeder of the red oxen of Sutton and Charlton, or of a dairy cow, than the butter and cheese makers of New Braintree and Barre, of Princeton and Shrewsbury. If the society shall require a pedigree traceable through the pages of the herd-books, shall its prizes be awarded to the best Durham or Devon, or shall the award be determined by reference to the adaptability of the breed or specimen of the herd to the soil,

the climate, the pastures and the wants of the farmers of our county.

Shall the improved Short-horn, which, in the language of one of the most eminent breeders of this stock, applied to his own animal, does not furnish milk enough to bring up her own calf, —round barrelled, fine boned, well conditioned, smoothly and beautifully built and duly authenticated by the book, bear away our prizes from the more unpretending old-fashioned Yorkshire or Teeswater, of the same early maturity, of equally large size and of far greater milking capacity, though of coarser build and less beautiful in form? In other words, will the society determine what rule shall govern its committees? determine this vexed question of pedigree? Shall the cow presenting unmistakable signs of her descent, vouched by her owner as of pure blood, be admitted to competition? Of more consequence still, shall it not be a condition precedent to a successful competition, that the cow shall exhibit unmistakable evidence of her ability to satisfy the first great want for which our dairies are kept—that of producing milk?

Without intending in the slightest degree to disparage the improved Short-horn, may we not, and ought we not, refrain from bestowing premiums upon any, which are not emphatically *milch cows?* These questions have been stumbling blocks in the path of the committee. Without consultation with his associates, they are presented at such length, without apology, by the chairman, that the society, by disposing of them, may open the way for a more general competition and more satisfactory award of its prizes.

Propriety requires the statement of the fact, that those of the committee who were competitors for premium, took no part in the deliberations of the committee while the merits of the animals among which their own were entered, were under consideration, and of course had no agency in determining the result.

W. S. Lincoln, *Chairman.*

HAMPSHIRE, FRANKLIN AND HAMPDEN.

From the Report of the Committee on Stock.

Soon after the formation of this Society, in 1818, Samuel Williams, of London, sent to his brother, Stephen Williams, of Northborough, the Short-horn bull, "Young Denton," (963 herd book,) and the cow, "Arabella," by "North Star," (460,) both bred by John Wetherell, who derived some of his original stock from Charles Colling. Among the number was the bull, "Comet," for which he paid one thousand guineas at public sale in the year 1810. I. Yeamans, in 1820, introduced into the town of Westfield, Short-horn stock of the Holderness breed, and is supposed to have taken the first step in this direction within the limits of this society. The farmers of Westfield have enriched their farms and their pockets by following the example of Mr. Yeamans. A cattle show is considered not complete unless the Westfield stock is on the ground.

About the year 1824, Samuel Lathrop, of West Springfield, purchased in Boston, Short-horn stock, and laid the foundation for improvement in this neighborhood. In the year 1834, T. P. & T. G. Huntington, of Hadley, purchased the cow, "Duchess," which was of the Denton family, above mentioned. Also the cows, "Princess" and "Rosemary," of the Holderness family. Also the then famous bull, "Lord Nelson." The introduction of this stock caused surprise. There was not room, in the opinion of a majority of the public, for the introduction of stock of "foreign blood"—having such high claims "in the line of descent," and bearing a name known only within the privileged circles of the crown. If this herd could have been as easily handled as "the tea," in Boston Harbor, the intruders would probably have been thrown over the county lines, and so on and on, till they were landed outside the State limits. The subjects were weighty, and growing steadily into ponderous proportions, *made* room for themselves. "Lord Nelson" never surrendered to, but set at defiance and finally conquered "a battalion" or more of ifs and ands, and doubts and fears, speculations and prejudices.

Paoli Lathrop brought into the field in 1837, five cows and heifers, the product of the Williams importation, before mentioned, and commenced breeding on an ample capital! His

success is widely known. He has continued his herd to the present time. About the same period, Hon. George Grennell, of Greenfield, had from Governor Lincoln, of Worcester, the Short-horn bull, "Governor," which he kept in use for five years. This strain of blood is still recognized in superior milking stock.

Alonzo Lamb, of South Hadley Falls, at the same period, was also the owner of valuable stock, and his success was equally noticeable. John T. and George E. Taylor, of Shelburne, have for some years bred Short-horns from the stock before mentioned. In 1844, Samuel Child introduced into Hampshire County the bull, "Northumberland," (4596,) bred by Mr. Prentiss, of Troy. The bull was kept by Mr. Child three years, and then, or awhile after, he passed into the hands of the Messrs. Anderson, of Shelburne. The Messrs. Anderson, now own the celebrated bull, "Roan Duke," from Thorne's stock. James S. Grennell, of Greenfield, owned the superior bull, "Colonel," and kept him for general use for three years. The Messrs. Smith and others, of Smithfield, have owned and bred from very valuable bulls. T. J. Field, of Northfield, now owns a pure bred Hereford bull, "Cronkhill, 3d." T. J. M. Smith, of Montague, and J. A. Clark, of Greenfield, have pure bred Hereford stock.

J. Fogg, of Deerfield, has a herd of pure bred Short-horn stock. Wells Lathrop, of South Hadley, has been very successful in breeding Short-horn stock. The "thorough bred" farmers of the "Wapping Club," Deerfield, have for several years had very superior Short-horn stock. "Sultan," from Juliand's herd, and another bull, also highly prized, was owned by this club.

Luke Sweetser, of Amherst, has been deeply interested in Ayrshire stock, and the record of his herd may be found in the annals of this society. Having kept his importation pure, he has been able to furnish pure breeding stock to various persons in this Valley.

Dr. Prince has a valuable herd of improved breeds at the State Asylum, Northampton.

Captain Dennison, of Colrain, owned *pure Merino sheep* at the date of the formation of this society. His flock was brought by him from Connecticut, and supposed to be from Colonel Humphrey's stock, which was a direct importation from Spain.

The farmers of Colrain and Leyden trace their best flocks back to the flock of Captain Dennison. The Cushmans, of Bernardston, also early introduced the Merino and the Saxony sheep. Pure bred South Down sheep were brought into Franklin County in about the year 1840, by Henry W. Clapp. These were from Thorne's importations. South Downs were afterwards introduced from Jonas Webb's flock by T. J. Field. Oxford Downs were introduced from Mr. Fay's flock in 1859, by James S. Grennell.

Capital invested in Stock in general at various periods.

SHEEP.

Years.		Hampshire.	Franklin.	Hampden.	Total.
1837.	Number, . .	64,274	55,713	29,950	149,937
	Value, . .	$354,131	$313,976	$148,641	$816,751
1850.	Number, . .	29,760	24,937	13,700	66,433
	Value, . .	$163,680	$137,351	$75,350	$376,381
1855.	Number, . .	22,127	19,107	9,389	50,623
	Value, . .	–	–	–	–
1860.	Number, . .	15,541	24,030	8,461	48,032
	Value, . .	$83,475	$132,165	$46,535	$262,175

OXEN, COWS, STEERS AND HEIFERS.

1840.	Number, . .	22,533	28,794	20,481	71,728
	Value, . .	–	–	–	–
1850.	Number, . .	22,395	26,940	22,473	71,808
	Value, . .	–	–	–	–
1855.	Number, . .	22,457	29,670	24,824	76,951
	Value, . .	$616,931	$761,745	$606,225	$1,984,904

HORSES.

1850.	Number, . .	3,982	3,372	3,709	11,063
	Value, at $50, .	$199,100	$168,600	$185,450	$553,150
1860.	Number, . .	4,065	3,984	3,563	11,612
	Value, at $70, .	$284,550	$281,880	$249,410	$815,840

Capital invested in Stock—Continued.

SWINE.

Years.		Hampshire.	Franklin.	Hampden.	Total.
1840.	Number, . .	8,955	11,352	8,818	19,155
1850.	Number, . .	5,060	4,216	5,058	14,342
1860.	Number, . .	5,453	5,667	4,219	15,339
1860.	Milch Cows, . .	9,558	9,349	10,000	28,907
	Working Oxen, .	2,918	4,000	3,610	10,528
	Other Oxen, .	11,110	12,898	9,059	33,167
	Value of Live Stock,	$1,086,172	$1,173,401	$995,160	$3,254,773
	Slaughtered, . .	167,496	221,856	197,747	587,072
1850.	Slaughtered, . .	205,845	164,676	180,242	550,763

Products.

BUTTER AND CHEESE.

Years.		Hampshire.	Franklin.	Hampden.	Total.
1840.	Butter, lbs., . .	739,663	696,641	623,351	2,059,661
	Cheese, " . .	388,956	517,629	704,546	1,611,131
1850.	Butter, lbs., . .	931,295	884,307	729,630	2,545,232
	Cheese, " . .	336,015	233,337	381,721	951,073
1860.	Butter, lbs., . .	1,164,760	931,539	787,843	2,884,142
	Cheese, " . .	318,113	236,654	421,992	976,759

Average price of butter from 1817 to 1840, 17 cents per pound.

Average price of barrel beef, No. 1, from 1817 to 1840, $10.25.

Northern corn, 84 cents.

GEO. M. ATWATER, *Chairman.*

HAMPDEN.

Stock Improvement in Hampden County.

While as a whole the farmers of this county have given but little attention to the improvement of stock, there have been honorable exceptions, and Hampden County has long been noted for occasional choice specimens.

More than fifty years since, or as early as 1810, Col. Abel Chapin, of Chicopee, bred a pair of steers which he sold in 1817 for one thousand dollars. These were exhibited in Boston, and afterwards slaughtered at Brighton. Others, but little inferior, were sent to New York market in 1822. These like others of his breeding, were (in part) of what was known as the Gore breed. It derived this name from being imported by Gov. Gore, of Massachusetts, and is believed to have been the unimproved Short-horn.

Col. Chapin was a man of uncommon sagacity in judging of neat stock, which, with his enterprise and ample means, secured for him the renown of possessing the best herd in this Valley, if not the best in New England.

In 1822, Col. Harvey Chapin, then residing at Chicopee, procured from Cornelius Coolidge, Esq., of Boston a bull called "Comet." He was grandson of "Comet" (155) which was bred in England by Charles Colling, Esq., and sold by that gentleman in 1810 for one thousand guineas. This is believed to be the first introduction of improved Short-horn blood. Some of this strain of blood is still found in the herd of Mr. Sumner Chapin, of Chicopee.

A few years later the Hon. Samuel Lathrop, of West Springfield, purchased a bull and one or more cows from Hon. John Wells, of Boston. By crossing these with his previous stock, Mr. Lathrop became possessed of a herd of fine animals, some of which possessed nearly all the characteristics of the thorough bred. The stock of that neighborhood was much improved by the use of his bulls, Dr. R. Champion still retaining some of their more direct descendants.

In 1832, Mr. Horatio Sargent, of Springfield, purchased a bull called "Red Comet," bred by Henry Watson, Esq., of East Windsor, Ct. This bull was son of "Wye Comet," who was begotten in England, but calved in Maryland in November,

1822. This was entirely a different strain of blood from the "Comet" brought from Boston by Col. Chapin. "Red Comet" had been sold and resold, and was obtained by Mr. Sargent from Mr. John Frink, of Stockbridge, Berkshire County, at a cost of two hundred dollars. He was kept by Mr. Sargent some years, after which he was sold for one hundred and fifty dollars, and taken to Woodstock, Windham County, Ct., where he was highly appreciated, and kept for service till he died a natural death, being found dead in the pasture, at the age of thirteen years. In Woodstock may be seen at this time a grandson of his, an ox seven years old, weighing nearly four thousand pounds. We believe it is no injustice to say that at that time no better bull than "Red Comet" had been introduced here, and some of the best grade animals are among his descendants.

About this time another infusion of improved foreign blood was made by the Rev. Alexander Phœnix, then residing at Chicopee. Mr. Phœnix purchased a bull calf from Judge Ingraham, of New York City. Many queries have been made with regard to the origin and blood of this animal, and some effort has been made to trace his descent, but without satisfactory results. His color was yellow and white, and while in general characteristics (except color) he resembled the Short-horns, his stock almost invariably showed strong marks of both Short-horn and Alderney. So striking are these marks, particularly the dun or mouse color, that they are distinctly visible in his descendants at the present time, although it is nearly twenty-five years since he left the vicinity. The cows of the stock were in general good milkers. Probably no more remarkable animal was ever introduced to the county.

In 1855, Phineas Stedman, of Chicopee introduced to his native town a pure Short-horn bull and cow from East Windsor, Ct., and laid the foundation of the choice herds now owned by him and his brother Benjamin. The original bull of the Stedman purchase was subsequently sent to the Sandwich Islands. About half of the towns in Hampden have now one or more representatives of this valuable Short-horn breed, whose influence is silently but surely spreading. They may be chiefly found with Messrs. Birnie, Demond and Moseley, of Springfield; Cols. Moseley and Root, of Westfield; Holcomb and Stevens, of

Chester; Sessions and Lyman, of Wilbraham; C. L. Buell, of Ludlow; Wilbur Wilson, of Agawam; Justin Ely, of West Springfield; and G. Munson, of Huntington. The well-known herds of Messrs. Wells and Paoli Lathrop, of South Hadley, although out of the county, are so near its northern limit as to exert a salutary influence upon Hampden County stock.

The Ayrshires, it is believed, were first introduced into the county on the 15th of April, 1849. The Massachusetts Society for the Promotion of Agriculture, that year, gave to the Hampden Agricultural Society the two-year old Ayrshire bull, "Swinley," whose great-grand-dam was known as the "short-tail cow that took more first prizes than any animal in Scotland," and whose grand-dam could make seventeen pounds of butter per week, and was considered at that time the best cow ever imported. His sire was the imported bull, "Roscoe," owned by Captain Randall, of Boston, and descended from the best milking stock of Scotland. The conditions of the gift were that he should be kept in the county, that he should not be put to service under the age of two years and six months, and that the Hampden Society should annually report the number and character of his progeny. This bull was kept several years by Deacon Daniel Merrick, of West Springfield, and latterly by Major William Burt, of Longmeadow; and his stock, although grades, are favorably known in those towns as good milkers. Justin Ely, of West Springfield, has now some of the finest specimens of this progeny known.

In May, 1850, the Massachusetts Society for the Promotion of Agriculture, presented the Hampden Agricultural Society the full-blooded Ayrshire cow, "Flora McDonald." She was old and destitute of teeth when received. Colonel Edward Parsons, of West Springfield, kept her several years, obtaining as issue only an inferior bull calf, which subsequently died on the hands of Elisha T. Parsons, of Ludlow. The cow was finally sold at auction for about twelve dollars, and died, leaving none of her progeny in the county. In 1858, William Birnie, of Springfield, purchased fourteen head of pure Ayrshires, the entire herd of E. P. Prentiss, of Albany. He has now twenty-nine of these creatures, most of which are very superior milkers.

Little is known of the origin of the Devons among us, though some of their characteristics pervade most of the old native stock. About twenty-five years ago, James Whipple brought to Chester a pure-bred Devon bull from Winsted, Ct., and traces of this animal are still found in western Hampden. Horace M. Sessions and D. B. Merrick, of Wilbraham are now the only breeders of thoroughbred Devons known in the county. This breed makes superior oxen, being active, hardy and tractable, and some of them rich and generous milkers.

The Herefords, or white-faced cattle, were first introduced into the county by Campbell and Hamilton, of Huntington. They were brought from New York. There are no thoroughbreds known in the county, but grades are abundant in both Montgomery and Chester.

The Alderneys are of more recent introduction. The first is believed to have been a bull kept by A. K. Abbott, of Chester, in 1857. They are found sparsely in Agawam, Chester, Chicopee, Longmeadow and Springfield. Randolph Stebbins, of Longmeadow, H. J. Chapin, of Springfield, and T. A. Dennison, of Chicopee, have the finest specimens yet exhibited at the county fairs.

Of sheep, pure Cotswolds may be found with D. B. Merrick, of Wilbraham, South Downs with William Birnie, of Springfield, and Oxfordshires with Colonel Aaron Bagg, of West Springfield.

In swine, the Berkshires and Suffolks have successively ruled the day, and the "Chester Counties" now claim the same privilege. M. S. Kellogg, of Chicopee, was one of the original importers and stockholders in the county, and breeds these animals more extensively than any other known. Pure animals of this breed are now scattered in Wilbraham, Agawam, Longmeadow, West Springfield and Springfield.

On the whole a great improvement is going on throughout the county in the different kinds of stock. The old native stock is not to be despised or rejected simply because not freshly imported, but only because there are better animals to be introduced. The long-legged, narrow-chested, loose-jointed, slab-sided, coarse-haired, and thick-headed stock, must eventually give way to those of opposite qualities, when such can be obtained. If a well-bred animal leaves his distinctive marks,

as has been shown, for a quarter of a century, how wretched the economy of using a poorly bred animal, even as a gift. Those gentlemen are deserving of great credit, who, stepping out of the old routine of their ancestors, deem it not money wasted, to purchase thoroughbred stock. Probably no one particular breed will suit every locality or individual taste. But we see no reason why the farmers of Hampden, with their diversified country may not have the choicest of all breeds, and notwithstanding the supples of the West, make extra stock raising successful and remunerative.

NORFOLK.

Statement of Arthur W. Austin.

Mr. Austin has furnished, under date of January 14, 1862, the following facts in regard to his Kerry cattle:—

I often had the milk measured during the past summer, and found it did not go below sixty quarts a day for five heifers of the first importation. On the 31st of May, the five alluded to, having in that month produced their first calves, gave sixty and one-third quarts, or an average of twelve quarts each. On the 14th of June the same five gave sixty-two and three-fourth quarts. Three of them gave a fraction over fourteen quarts each. I weighed the morning's milk, and the thirty-one and two-thirds quarts, wine measure, weighed sixty-seven and one-fourth pounds. Of the two last imported heifers, one is fully equal to either of those of the first importation, in proportion to age, she being a year younger, and having given with her first calf over ten quarts per day during the summer. I do not think the other one comes up to the standard, but she holds out well, and gives rich milk. The milk of all of them is of the first quality as to richness. Butter is obtained from the cream in a very short time. Late in October it required less than five minutes churning, by the clock, to bring the butter. A lady who sends for six quarts once a week, and who has had much experience, pronounces the production of cream marvellous. She says she skims it several times over. I have had excellent milkers of different breeds, and have always been particular as to *quality* more than *quantity:* but I obtain from these Kerry

heifers as large a quantity of milk as could reasonably be expected, considering their size and age; and the quality certainly surpasses, on the average, any milk it has been my fortune to see. I have now, besides the imported stock, three pure-blood bulls, which will be a year old in the spring and summer of 1862, three pure-blood heifers and one steer of the same age, one half-blood Kerry and Shetland steer, and three half-blood Kerry heifers. All have improved wonderfully under my winter regimen. We think all the imported heifers are in calf to Mountaineer, who is in fine condition.

FEEDING OF STOCK.

NORFOLK.

Statement of A. W. Cheever.

Wishing to make some experiments in feeding cows on grain crops, &c., I sent a notice to the secretary of the society, which he was desired to accept as the first step toward an entry for premium for the best experiment in soiling cattle. I also requested the committee, through him, to make any suggestions they might think proper in relation to the matter. As I waited to hear from the committee, I neglected to commence at the proper time to weigh and measure and keep an accurate record of dates, &c. Therefore I have now no such statement to make as I intended and hoped to have. But I will tell you, in a general way, what we have been doing, not only during the present, but in past years also.

My father's farm, on which I am a laborer, is not naturally good pasture land—being too cold and wet to produce sweet feed, unless drained and cultivated. It is too strong, also, to be worth reclaiming for pasture alone.

On this account we have for several years been trying to work into a course that would leave us less dependent on pasture for support of our stock. As a preliminary step, we set apart a number of acres as *unimprovable:* where the growth of wood should be encouraged, instead of our former practice

of mowing the bushes, and pulling up the young pines every year or two. We then devoted a liberal share of our mowing lots to pasture, and commenced making thorough work with the remaining mowing and tillage land—such as draining, clearing off surface rock, and removing inside stone walls. In this way we are now fast getting our tillage land into one entire lot, which very much reduces the cost of cultivation. After having cleared and drained our tillage land, at very considerable expense, it seemed that we ought to make it produce larger crops than it had done before. This could not be effected, of course, without manure; and of this we found it impossible to make a sufficient supply during the winter season. We have, therefore, fed our cows this summer on green food more than usual, always in the stall. Let me here say, by the way, that I am convinced that much of the prejudice against corn fodder for cows is owing to the fact that most of those farmers who think green cornstalks will dry up cows and lessen the quantity of milk, or, at any rate, can do them no good, are in the habit of feeding their cows in the pasture—throwing the corn over to them directly from the field where it grows—thus tempting them to hang around the field the remainder of the day, instead of going off and feeding contentedly.

We have fed, this summer, green oats, clover, southern corn, and the tops of turnips and mangolds. We have made no accurate experiments by which to determine the comparative value of each sort of feed. We prefer a variety and change of feed, and are inclined to the opinion that good English hay may well form a large part of the food of milch cows in summer—perhaps with as much economy as any of the green food. It ought always to be on hand, to be fed when the days are rainy, and when the cows have become too much relaxed by the use of green food. Our cows have run in the pasture a part of every day through the season. They are put into the barn and milked at five o'clock in the afternoon, and turned out again at from eight to twelve o'clock in the morning—according to the weather and the amount of feed in the pasture. We have also given to them a mess of shorts or meal every morning until fall, when pumpkins took the place of grain.

Our cows lie on a floor, four feet eight inches in length, back of which is a gutter, twenty inches wide and six inches deep,

where the droppings fall. These are removed several times daily, and the floor is sprinkled with a few shovelfuls of sand to keep it sweet and clean as possible. The manure falls into a cellar, where it is worked over by hogs, and mixed with dry loam to absorb the urine. In order to have this dry material to compost with, we have built a tight shed adjoining the stable, where, in dry weather, is laid up enough loam to last several months. It requires a much smaller quantity of dry than wet loam to absorb the urine, and of course the compost will be less "extended."

As one chief object in soiling has been to increase the quantity of manure for use on the farm, I have kept an account of what we have made during the past six months—beginning in May—from five cows, two horses, and four hogs. The manure is all made in one pen. We have carted out and have on hand twenty-six cords of what we consider good manure, valued at five dollars per cord. This is at the rate of just one cord per week from May to November. Two-fifths of a cord were used in July for a second crop of corn fodder. Seven cords were used for rye in September, and the remainder we are now ploughing in for a crop of corn next year—thus getting a good part of spring work done in the fall, which could not be done if, as formerly, we depended only on our winter's stock of manure for the next summer's crop.

WRENTHAM, November 21, 1861.

SHEEP.

HAMPSHIRE, FRANKLIN AND HAMPDEN.

From the Report of the Committee.

In the attempt to make our report, we see no reason why we should approach it with that discouraging feature which has heretofore too often accompanied the exhibition of sheep. Although the sheep on exhibition were few in number to what they should be, (and we think to what they will be in the future,) they were far superior, both in number and quality,

to last year, thus indicating a renewed interest in that most pleasant, and certainly profitable branch of husbandry.

The whole number of entries this year was twelve, against five last year. Whole number of sheep on exhibition, thirty-four, against fifteen last year; thus you see, allowing the increased number of sheep on exhibition to represent the interest in sheep husbandry, it has more than doubled during the past year. This, we think, looks encouraging that the day is not far distant when the pastures and meadows of Hampshire County shall be made to assume their former productiveness, which can be done in no other way, attended with so little expense, as a thorough cultivation of *sheep*. The majority of sheep on exhibition were of the graded South Down breed. The buck belonging to Joseph Hatfield was a fine specimen of the breed, which we did not hesitate to pronounce, taking all points into consideration, superior, although there were others which deserve no less notice, had we space and time to speak of them separately, as we would like. The principal points by which we were guided, were those which related most particularly to the yield of wool and mutton combined, as it is generally conceded by those most experienced in sheep raising, that the middle-wool sheep will return the greatest pay to the farmer. In speaking of the different breeds of sheep, we shall not attempt to say that this or that breed will return the greatest profit. We can merely state that which we have gained by conversing with the experienced sheep-raiser, observation, and a limited experience. You will find by referring to the English reports on sheep, that the South Downs rank among the highest in Great Britain, for reasons laid down in the secretary's report—disposition to fatten, earlier maturity, heavier carcass, hardihood and capability of doing well on poor pasture. Allowing these properties to be true, the South Down is certainly a profitable breed, and should be strongly adhered to. The Leicester, Cotswolds and Cheviot, also rank among the highest in Britain. Blake says: "Each one has its peculiar qualities, claiming superiority to the other breeds." It will be recollected that opinions upon such subjects are often ruled by self-interest. One thing is probably certain, that among the English breeds, no one has been bred with as good success in retaining the most desirable qualities of the original breed, as

the South Down. This has been done by Mr. John Elman, who seemed to take hold of the business with a strong determination to succeed. In the fall of 1858, I conceived the idea that the sheep which would yield a medium grade of wool, with a good mutton frame of about one hundred pounds, would be the safest, if not the most profitable, to invest in. I therefore heard, after making numerous inquiries, of a very successful breeder of sheep, Mr. L. Wilcox, of Orwell, Vermont, who, I found on visiting him and looking over his flock, had, by crossing the Spanish Merino with the Cotswold, procured a fine looking sheep, both for mutton and wool, although I think there might have been more improvement in the wool if he had crossed with some other of the English breeds; but we will take the breed as it was. I purchased one hundred and fifty, two and three years old ewes, intending to keep a part, at least, for my own culture; but, as luck would have it, I sold them, but always regretted it. I sold them in two lots; the largest lot fell into the hands of a feeder, and soon found their way to the market. The other lot of fifty went into the hands of an experienced raiser and breeder of sheep, Horace Russell, of Hadley, who was one of our committee. Mr. Russell says, as far as his experience has gone, he can testify in favor of this breed. He has raised some of the best lambs for early market that have been raised in this vicinity. His wool, although sold at the extreme low price at which wool started the past season, brought upwards of one dollar per head. The farmer who is about to purchase a stock of sheep, must not be governed by what this or that man says, but must study his own convenience and exercise his own judgment in part, as circumstances alter cases. You are aware, ere this, that I am in favor of the middle-wool sheep. True, I am. I am well aware that I shall not agree with some in making the following statements in favor of the middle-wool sheep. 1st. The middle-wool sheep will not consume three-fourths of the feed that is necessary to keep a coarse-wool mutton sheep in fair condition. 2d. I have always met with better success in raising early lambs for the market, than with the coarse breed, as they fatten much more readily, mature quicker, and it is always the pet lamb that finds a ready market and good prices. 3d. They are a hardier sheep, can be kept in larger flocks, (which is quite convenient for many,)

less inclined to ramble—the latter being a particular item to look after with our hill farmers. 4th. They are a much safer breed to invest money in, for, as the old adage is, we have two strings to the bow. In case the mutton meets with a hard market, the wool may help make up the loss; on the other hand, should we be obliged to dispose of the wool at the uncommon low price to which it has been subject for the past few weeks, the mutton, perhaps, will bring us around with a fair profit.

The next subject that suggests itself is, the culture of sheep in general. We find by referring to the statistics, that the number of sheep in 1840 was 378,226; in 1850, 188,651; in 1860, 113,111; showing a decrease in twenty years of 265,115. In 1845, the number of pounds of wool grown was 1,016,230; in ten years from that time the decrease in the production of wool was over 600,000 pounds. In 1845, the value of all the sheep and wool was $923,430; in ten years later, $464,889; showing a depreciation of that stock in ten years of half a million of dollars. In 1850, the wool produced in this State was 585,000 pounds, while the amount consumed outside of domestic manufactures was over 22,000,000 pounds. The question is asked, what has caused this wonderful decrease in the sheep culture? Probably there are several reasons. The fluctuations in the price of fine wool, as it was this grade of wool that was principally grown in 1840; the idea that we could not compete with importations; the destruction of sheep by dogs—the latter, to which we have an abundance of testimony, that dogs have been one of the greatest impediments in the keeping of sheep. This, many would hardly believe; but when they find that the number of sheep killed in the State of Ohio, in 1858, was 60,000, and half as many more injured, making in all upwards of 90,000, valued at (say $2 per head) $180,000, they will not wonder that our legislators were induced to pass a stringent law, imposing a tax upon dogs. Although this dog law has in a great measure removed this obstruction, still, if it cannot be more thoroughly executed, there must be a more stringent law to expel this nuisance.

The question is often asked, are sheep as beneficial to the soil and farm as cattle? This question, I think, will meet with those who have had experience with the culture of both cattle

and sheep, with a ready answer, that the fertility of the soil can be better kept up with sheep than any other stock. It is hereby necessary that they be properly fed and housed, and that the droppings be preserved. In doing this the sheep are not allowed to run at large, but are kept in this inclosure that the manure, by frequent bedding, and two or three times during the winter applying a coat of muck drawn from the woods, as this we consider the most valuable on account of the vegetable matter and elements contained in the decayed leaves, which have accumulated, spread over the pens, may be saturated with the excretions of the sheep and preserved in full strength, instead of being thrown out doors and exposed to the rain and sunshine, and thereby lose a large part of the most essential elements of the manure. This is one reason, with others which I might give, that sheep feeding is fast taking the place of cattle, in this vicinity, where particular attention is being paid to enrich the land for the culture of tabacco and Indian corn.

As we have spoken of sheep feeding, perhaps a word will not be amiss. As I have said before, we must study our own convenience in part, and by doing this we find that the farmers on the immediate borders of the Connecticut Valley, have not the conveniences necessary for the breeding and raising of sheep, but for the want of pasturing, find it more convenient to buy their sheep in the fall, or first of winter, feed through the winter and dispose of them in the spring. Although it is conceded by all, that the fatting of sheep pays much better than cattle, (particularly for the past three years) still it does not remunerate us in all cases full value for the hay and grain which they consume. Hence, the question arises, how shall we manage to get the best pay? We often hear the remark made, "my sheep cost too much." This, in some cases, may be true, still, in five cases out of six, it serves as a mere excuse, the fault being in the feeder. Sheep need good care, and particular attention should be given to feeding—that they be fed regular and at given times. The idea that sheep will fatten if they get their feed in course of the day, let it be ever so early, is an absurd one, and experience will prove the fact. But we will return to the question, How can we get the best pay for our hay and grain? In answering this question, I can merely state that which I have gained by experience and observation.

Here again we shall bring up the middle-wool sheep to start with, as being the safest to invest in, applying the same reason which I have given before,—in case the mutton meets with a hard market the pelt will help make up the loss. While the middle-wool sheep can be purchased at a fair price, the large, coarse-wool, mutton sheep demand fancy prices, and we have the mutton alone on which to depend, which has for the past two or three years, sold no higher nor met with no quicker market than the medium grade sheep, whose weight is about one hundred pounds. Sheep intended for stall-feeding should not be allowed to run out late in the fall; just as soon as they stop gaining they begin to lose, and if allowed to run two or three weeks it will take till mid-winter to bring them up again, thus losing the most essential part of the winter for fattening. Another thing very essential is that they be penned off in small lots of say twenty each, that they be graded, separating the larger from the smaller ones, that each one may get his due allowance of feed, and not be overpowered and robbed by the stronger ones, some getting too much, while others get but little; thus the flock comes out very uneven, many being unfit for market, and finally are sold for less than their value. The rule for feeding, which I have adopted after trying different ways, is: The first thing in the morning sweep the racks perfectly clean and feed with grain. After this feed twice with good hay. After this is consumed, fill the racks with second quality of hay or good oat straw and then keep entirely away until feeding time at night, when the refuse is thrown under their feet, which serves as bedding, and then go over with the same procedure as before. The more quiet they are kept the faster they will fat.

Another very important item: What kind of grain can be fed to ensure the greatest profit? This is a question which experiment must prove. All other things being equal, I believe it is generally conceded by experienced feeders, that corn alone cannot be fed with safety unless great care is taken in the commencement. It is too heating—liable to impair the physical organs and thus unfit the sheep for fatting. The English feed for fatting sheep consists of cotton seed and turnips. They claim that it will put on the most fat, is the safest feed, makes the best mutton at a less cost, and produces the best and strongest

manure,—the latter of which would be quite an important item. If this be true, (and I see no reason why we should dispute it,) let us try it. It certainly is an easy thing to test, as the turnips can be raised at a small expense, and the cotton seed can be bought in the market at a less price than at our mills; and be sure of getting the pure thing. And if, on giving it a fair trial, it should prove what the English claim it to be, we should feel as if we had found the great secret to success in sheep feeding.

But I am aware that I have already wearied your patience and I leave these most interesting and important subjects to abler pens.

Respectfully submitted,

J. E. WIGHT, *Chairman.*

FRUITS.

MIDDLESEX.

APPLES.—*Class No.* 1.—To most farmers in the county, with the exception of the grass crop, there is no one interest that equals in importance the culture of the apple—in the benefit arising in increased health and comfort from its free use, and the avoiding of large expenditures in their families. For feeding stock, careful experiments have proved it admirably adapted. As a source of income, it calls for the closest attention, from the setting of the tree to selling the fruit; it is valuable for the certainty of the product, and attended with less labor and expense than any other crop in proportion to its value.

The famous orchard of Pell, in New York, rendering an almost fabulous income, is not chance alone in the adaptation of the soil to the tree, but the result of careful study and constant attention. The most thrifty trees were set, the ground always kept scrupulously clean, and the trees full fed with a variety of manures, ending with sales in London or New York at prices nearly double that of his more careless neighbors.

What is the frequent management in our own county? A hole is dug, rather small for a decent post, the roots of the tree cut off to fit the hole, mice and the plough take off a large part

of the bark, borers try the quality of the wood, and finally, the top is taken off by some half-starved cow; the farmer concludes that raising fruit is very poor business, and gives up the experiment in disgust.

As a source of comfort and material prosperity, its culture cannot be overestimated. With as oil well suited to its success ful growth, one of the best markets in the world easily accessible, and the great markets of Philadelphia and Baltimore as a reserve for the sale of his late varieties, the merchant of the city has no greater facility for an advantageous disposal of any number of barrels in those cities, than the producer; always bearing in mind the nearer the grower of the fruit comes to the consumer, the greater his profit.

A fertile soil, devoted entirely to the growth of the tree, is an essential requisite of success. The expense of preparing the ground, purchasing and setting trees, will not exceed $20 an acre. Allowing, for ten years after, the purchase of $25 an acre for manure, the trees and crops during the time will pay interest and expenses; and at twelve years, many an orchard has produced its four barrels to the tree, paying all expenses in a single year. In the culture of the tree, removing the outer bark at any stage of its growth is of doubtful expediency; the tree may, perhaps, require some pruning to check a too vigorous growth, but as a protection from the sun's rays all the bark should remain. The two great enemies of the tree and fruit, the borer and curculio, are not sheltered by it, and other insects are of minor importance. Clean culture, with plenty of manure, is of more benefit than an iron scraper.

Where the intention is a market orchard, two or three varities are sufficient. Accidental circumstances may make the Williams or a Sweet apple valuable for a few years, but high prices are not to be depended upon, while the Baldwin and Russet are long keepers, and with the Hubbardston, are always reliable. Perhaps, for pasture trees, no apple equals for profit the Hubbardston. The farmer who has a stock on hand, should be as well acquainted with the markets of New York and Baltimore as he is of Boston. And always bear in mind the fact, that it requires much more skill to raise the fruit in the greatest perfection, than to sell it to the best advantage.

SAMUEL H. PIERCE, *for Committee.*

LINCOLN, September 19, 1861.

Apples.—*Class No.* 2.—In commencing the cultivation of apples the attention should be first turned to the old trees on the farm. There are but few trees that have any young thrifty shoots that are not worth grafting; all that are useless, cut down; if allowed to remain they injure the appearance of the farm. The remainder should be very thoroughly pruned and grafted; the expense is trifling, and they will sooner come into bearing and yield better than young trees. On my farm there was an old tree so far decayed that it was swayed back and forth by every wind. I grafted it, although thinking it might prove time thrown away; but it bore two or three bushels of the first quality of fruit for a number of years, and with other old grafted trees, furnished a plentiful supply of apples while the young trees were growing. In grafting either old or young trees after the first year, but one scion should be allowed to grow in each stock; the other must be cut out as they will seldom unite firmly, and when large, the weight of the fruit or the high winds will be likely to split them apart.

In commencing a young orchard, a piece of land should be selected where the soil is deep and rich—not too wet, or if wet, should be thoroughly drained; if rocky, it is no objection, except the extra labor required to clear it for cultivation; it will not be injurious to the growth of the trees, but will be beneficial. In selecting the trees for the orchard, purchase the best that can be obtained, remembering that the few cents difference in the cost of a good or poor tree will prove a loss instead of a gain. Trees are almost always set too near to each other. Most planters say two rods each way, but I prefer thirty feet by forty; the greater distance giving the sunlight a better opportunity to act upon the trees, causing the fruit to ripen sooner, and also rendering it much easier operating between the trees with a team when cultivating the ground. The trees should be planted in perfectly straight rows both ways, not only as a matter of convenience but it gives a neat and tidy appearance to the orchards. The holes should be dug deep and large, and care taken not to set the tree too deep; a great many failures in transplanting trees of all kinds are attributed to this cause. Care should also be taken that every root is placed in its natural position. In filling the holes, any old refuse about the farm, such as scrapings from the wood pile,

old bits of leather, old boots, hats, rags and bones may be used, but they must not come in contact with the roots; when they need them they will reach after them and receive benefit from them. The ground in the orchard should be well cultivated and highly manured; a young orchard requires as high cultivation and as much care every year as a crop of corn. The trees should be pruned high from the ground, so that horses or oxen can pass under without injuring them; if care is taken in forming the trees while young, they will need very little pruning afterwards, and if pruned while young, it matters very little at what time of the year it is done. Thin the branches out well, that the light and air may have free access to the very centre of the tree.

As to the varieties most desirable, if near a market, or where the access to one is easy, it is well to raise the summer and fall varieties; but for the main crop, and at a distance from the market, the winter kinds are the most profitable; the Baldwin is the most so, and also the most sure of a crop in all the soils of New England.

One would suppose from the large number of apple trees transplanted every year, that the supply would be much larger than the demand, but it has not been so as yet, and I think there is no danger of it in the future. But a small proportion of the trees planted produce fruit. Many people think if they buy and set them out, that is all that is necessary to ensure a fine orchard; they sow the land down to grass, turn the cattle in, and in a few years not a tree is to be seen where a thrifty orchard should have been. Where a person has only a small piece of land, apples, dwarfed or the paradise, can be cultivated with great success; the trees do not grow large, therefore do not shade the land necessary for a garden, yet will yield abundantly; the fruit will be very fine, equal to that grown on standard trees, and I would recommend that they be more extensively cultivated in gardens.

In many of the county societies a premium is offered for a large number of varieties, and to obtain the requisite number many worthless kinds are raised. A great many poor varieties are sold by the nursery-men when there are comparatively but a few varieties that are worth cultivating. Although the improvement in the cultivation has been so great, yet the farmer

need not think that the task is accomplished. But I hope that each year our tables will show an improvement in quality rather than in the number of the varieties.

ANDREW WELLINGTON.

LEXINGTON, September 19, 1861.

GRAPES AND ASSORTED FRUIT.—The cultivators of fruit have suffered very much the last winter from the severity of the season or the extreme changes in the temperature of the atmosphere, by which almost all the bearing wood of the grape vines (wild ones as well as those cultivated) were killed, and the more tender varieties lost all their wood down to the ground unless protected in some manner. And among horticulturists there is quite a difference of opinion as to the time when the vines and fruit trees were injured—some contending that the damage was done on the night of the thirtieth day of September, 1860, and the two succeeding nights, at which time the thermometer fell to twenty degrees above zero, and at the same time apples were frozen in some cold locations on the trees. But it seems to us that no such injury to the trees and vines could have resulted from the cold of those nights. In connection with this inquiry, we have observed that almost all of the peach trees, particularly the large old trees, have been killed outright, and the smaller ones have suffered very much, having had their tops badly killed. Quince trees have suffered as much or more than the peach, many of them being entirely destroyed. Pears lost most of their fruit buds, and the more tender varieties some of their wood, and the crop of fruit was nearly or quite a failure. Apples, although we could not expect a large yield the present year, following the very great crop of the last, still we had reason to suppose that the trees whose habits have been to produce a crop the odd years, would this year have been fruitful; but the fruit buds were to a large extent destroyed some time between September, 1860, and April, 1861. The result has been a very meagre crop of poor apples.

And thus the failure of the fruit crop and the damage to the trees and vines has been general, not confined to grape vines, but all trees and vines suffered more or less according to their

hardiness and the amount of protection given them. The theory of the chairman of your committee, of the time that grape vines were injured, is that it was after the middle of February, 1861. The month (February) was quite mild for the season of the year; the snow, except in the woods or near walls where it had drifted, had all gone, and the frost was entirely out of the ground in many places. At that time I trimmed sixteen Concord grape vines, having forgotten to trim them in November, (which is a better time for that purpose,) leaving the canes from four to six feet long, which was nearly all new wood. I took the strongest of the new wood, trimmed off for cuttings, covered them with earth, and planted them in the spring. The most of them grew and are doing well. I found in the spring that the canes I left for bearing on the vines trimmed, were killed down to the top of the snow bank which had lodged about the wall near which the vines were planted, showing by the growth of the cuttings that the wood was killed after the vines were trimmed.

Immediately after the time of trimming in February, or about the first of March, we had one of the most remarkable changes in the weather that I now remember. The thermometer at two o'clock, P. M., (Sunday,) being up to eighty degrees above, and the next day following, to ten or fifteen degrees below zero —a change in a little more than twenty-four hours of nearly one hundred degrees in the temperature of the atmosphere. Was it not this sudden and remarkable change, from very warm and open weather for winter, by which the sap in the vines might be excited to some extent, followed by sudden and severe cold, the cause of the damage? They must have been injured by this sudden change of the weather or by some change afterwards, for up to this time they were alive, or the cuttings taken from the vines would not have grown.

But with a little trouble and care we can be perfectly independent of the weather in the winter, simply by laying the vines down on the ground, (where, if in vineyard culture, they should be pruned down to keep them from being threshed around by the wind,) which would be enough protection for any hardy grape like the Concord, which I have known and watched since it was first fruited, and it is the first time I have seen any of the wood of this variety killed by the winter. But a light covering

of soil or of pine boughs, would, for the more tender varieties and for many of the varieties called hardy, be better still. It is not much trouble to lay down vines where they have been managed properly when young, which should be done by training them two or three feet to one side, with but a little inclination from the ground, before leading them up the pole or trellis; by so doing they can be laid on the ground without any crippling of the main stem. But with all the drawbacks which the cultivators of the grape have to contend with, I think with a proper location and selection of varieties, it is more certain to produce a crop, and one that will pay, than any other variety of fruit which we cultivate. It is not subject to attack by so many insects as other fruits. About the only insects that attack the vines in thisvicinity being the thrips or vine hopper, on the under side of the leaves; they can be killed by syringing the leaves with strong soapsuds; and the rose bug, which eats the blossom; the latter must be picked off by hand, with the consolation that after having been picked and destroyed for one or two years, they will diminish materially.

The effect of even a slight protection was strikingly illustrated on the ground of Mr. T. F. Hunt, of Concord, one of the exhibitors of grapes the present year. On a long trellis on his grounds, covered with a vigorous growth of vines, the fruit buds were entirely killed, and many of the vines have received a severe shock, which it will take some time to recover from. Near by were one hundred Concord grape vines, planted two years previous, which had been allowed to remain on the ground; they blossomed full, and were tied up to poles the last summer, and produced a fine crop of excellent fruit, which readily brought at wholesale nearly seven dollars a bushel for the entire crop. In this instance, simply their laying on the ground saved the fruit buds from winter-killing. But for rather tender varieties, to make it certain that they will not be injured in the winter, it would be better to cover the vines; the best way to do this is, to lay the vines down on the surface of the ground and cover with soil, being careful not to take the soil from near the vine, so as to leave a hole for the water to stand about the roots in the winter. Vines and tender shrubs are often injured in the winter by covering with hay or manure, which ferments and rots the buds. Covering with soil, so far as my experience

goes, is the best, cheapest and most expeditious way to protect vines that are rather tender.

This inquiry is often made: which is the best way of trimming grape vines for out-door culture? and it is a hard question to answer, each different way having something peculiar to itself which is convenient or favorable to a good development of the vine or fruit; but as far as my experience goes I prefer what is called spur pruning; but in experiments that I am now making, I very likely may see cause to adopt some other mode. The almost universal fault in trimming is extending the vine too fast, by that means losing the lower spurs and fruit bearing branches, and finally ending in a long, straggling, homely shaped vine, which will not produce so much or as good fruit, neither is it so convenient to train upon the trellis, or to trim afterwards, as it would have been if properly trimmed in the first instance.

How and when shall we plant the vines? Plant in a deeply-ploughed, well-drained, mellow soil, which has been enriched with compost manure, made of peat and cow manure, tow hich has been added ground bones, or spread the bones on the soil before ploughing; and it would be well to apply a dressing of ashes and gypsum, and let the whole be well and thoroughly mixed with the soil by ploughing; and in planting, open your holes or trench about eight or ten inches deep, and plant with good two years old vines, that have been growing in the open ground—they being much better than vines grown in pots that have their roots all coiled and matted together—spread out the roots evenly, and cover them with mellow, loose soil, which is much better than manure on the roots; when all has been levelled off, have the roots about six or eight inches under the surface of the ground, which in our climate is undoubtedly better than deeper planting; the roots being near the surface of the ground and more exposed to the heat from the sun, will cause them to ripen earlier than if planted deeper in the ground. I suppose the most favorable time to plant is in the fall, after the leaves have been killed by the frosts, and before very freezing weather; but either fall or spring will answer well enough, only let the work of planting be well done. And if you purchase your vines I wish to repeat what I have partly stated before—that is, buy good, strong, vigorous vines, two

years old, grown in the open ground; they are better than vines older or younger, and you may rely upon it that the above statement is correct, whatever interested parties and dealers may tell you to the contrary; and most of them will tell you that any variety and of any age that they may have a stock of, is just what you want; but rely upon your own judgment, or upon some friend who understands the matter, and select a variety or varieties that are hardy, early, prolific, handsome fruit and bunch, good quality, berries adhering well to the stem, a vigorous grower, and not subject to mildew. With such a variety, well planted in a good high location, with an aspect towards the west, south or east, you will be pretty sure to succeed. If you decide to purchase some of the new varieties, do not be disappointed if they do not come up to the statements of the venders; for if you do not expect it, you will have to buy many of different kinds, to find one that is better than some of the old varieties. I do not mean to say I would not buy any of the new varieties, but simply that such purchases be on a small scale, until satisfied of their worth.

Good grapes will always sell here for a fair price, both for the table and for wine. Concord grapes are now retailing from twenty to twenty-five cents per pound in Boston; and in these hard times, with the market full of Catawba and Isabella grapes from the West, which are retailing from twelve to fourteen cents per pound, good Concords are better than Western Catawbas or Isabellas after being transported from the West here.

The president of your society, Mr. Bull, who you well know has devoted a large portion of his time and means for the improvement of the grape, by raising new varieties from the seed, without resorting to the process of hybridization with the foreign varieties, which are not near as hardy as the American grapes, invited your committee, as has been his custom heretofore, to examine his new seedlings, many of which bear fruit the present year. His method is to let them take their chance in the winter without any protection whatever, believing that any variety not hardy enough to stand the winter is not worth growing. At the time of our visit, there were quite a number of the new seedlings bearing fruit, which were of various colors. Among them we tested some thirteen varieties

which were very good. He had also one black variety which was very sweet, thin skinned and early, at least a fortnight earlier than the Concord; and a number of other black varieties which were very fine, some of them earlier than the Concord; also a number of light colored varieties, of fine quality; also the two very fine flavored seedlings, exhibited at our exhibition the last year; the one resembling the White Nice in color, fully sustains its reputation of last year, as being superior to any hardy grape known to your committee, for the table, and also earlier than the Concord. We were much gratified to find these varieties still holding up to their last year's reputation for earliness, fine quality, size of bunch and of berry, and hardiness, giving promise of something better for general cultivation for the table than even the Concord, now so generally accepted as the best hardy grape.

Wild grapes are gathered and sold in large quantities in this vicinity for the purpose of making wine, which is manufactured from them by various parties for sale, all of which is of an inferior quality, partly from the manner of making, but more from the inferior quality and unfitness of the wild grape for that purpose. The Concord makes an excellent wine—pronounced by good judges superior to the best Catawba wines—and the president of your society, at our request, has kindly consented to write an article on wine making, which will be published in our Transactions.

We were much gratified to find so good a display of grapes at our exhibition the present unfavorable season; and although it was not so good as last year, still it was better than we expected to find. There were on exhibition quite a large number of dishes of the Concord, also dishes of Isabella, Catawba, Diana, Delaware, Dracut, Amber, Hartford Prolific, Muscadine, various kinds of wild grapes, a few dishes of Black Hamburg, and Chasselas grapes, making quite a pretty show. For the purposes of general cultivation, your committee were unanimously and decidedly of the opinion that the Concord was by far the best grape shown. The Delaware, shown by Messrs. Brackett & Wellington, was very small in bunch and in berry—the berries and bunch not much larger than bunches of large Gondowin currants; the quality was good, but the small size of the bunch and berry, if those exhibited were a

fair sample to judge from, would render it unfit for cultivation except by the amateur. The Isabellas and Catawbas were not nearly ripe; Amber, sweet and ripe; Diana, not quite ripe. The other varieties were unripe, except the wild ones, which were like all wild grapes, foxy, and would not be eaten by any one who could procure a Concord, Isabella, Diana, or any of the good varieties.

Your committee would recommend to those about planting the grape, if they intend to plant one vine only, to plant a Concord; if a dozen, let most of them be of that variety also, because they are handsomer than any other variety said to be suitable for our climate; as hardy as any kind grown, not excepting the wild, foxy varieties; as early as any good variety and earlier than most of them; as good in quality; as productive; not liable to mildew; a vigorous grower; more salable in the market, and combining more good qualities than any variety that has been well tested, in the knowledge of your committee.

JOHN B. MOORE, *for Committee.*

CONCORD, Sept. 19, 1861.

HAMPSHIRE.

From the Report on Fruits.

APPLE TREES AND APPLES.—A farm without an apple orchard is a sad spectacle; the farm is quite as imperfect as our national flag without the stars. The farmer who has, and wishes no orchard, lacks both taste and economy. Taste, because an apple orchard is a "thing of beauty;" economy, because raising apples is a source of decided profit. What more beautiful scene than an apple orchard in full bloom, in the freshness and glory of spring-time? The trees themselves elegant in conformation, and clad in their simple, leafy verdure, are ornaments. But when crowned in the blooming-time with millions of blossoms, pink and white, and laden with sweet perfume, they remind us of the "Elysian fields."

Apples are a palatable and healthful article of food; eaten without preparation they are a luxury, and the choice dishes

such as sauces, preserves, tarts and various kinds of pastry, that can be made from them, are manifold. As an article for the market that always meets with a ready sale, apples have no rivals. An orchard standing on a single acre of ground will afford more profit than can be obtained from the acre in any other way. I will show this hereafter.

BRIEF HISTORY OF THE APPLE TREE.

The apple tree has a very remote origin. According to an ancient tradition Adam was choked with an apple tendered him by the fair hand of Eve; said accident caused a remarkable protuberance on the anterior part of his throat. This peculiarity has been transmitted and inherited by all the sons and daughters of the original proprietors of Eden. The old anatomists made use of this curious tradition, and named the prominence in question, "*Pomum Adami*," or Adam's apple, and it bears that name to the present day. Skeptics will probably doubt the above narration, but they will credit those ancient Greek and Roman naturalists who described the apple tree and its fruit with great accuracy. Theophrastus, Heroditus and Columella, all make mention of the apple tree. Pliny says, that the Greeks called them "Medica," from the country where they first originated. Pliny described them as a fruit with a delicate, tender skin, easily pared off. He says of the crab apples, or "wildlings" that they are small and sharply sour, for which peculiarity they receive many curses. Columella, a practical husbandman who lived and wrote long before Pliny's time, not only describes the apple tree but also the process of grafting, and gives several different methods which he says were handed down from the "olden time."

Apple trees were brought to this country very early. In 1629 by the order of the "Governor and company of Massachusetts Bay, in New England," apple seeds were brought from England into the colonies; and Governor's Island was granted to Governor Winthrop in 1632, on condition that he should plant a vineyard, and an orchard. The pilgrims also cultivated orchards near Plymouth rock soon after their arrival.

Many of our best varieties of apples originated here among us. The Baldwin originated in Wilmington, near Boston, more than one hundred years ago, and for a long time was called

the "Butter's apple," or the "Woodpecker apple." Rev. William Blackstone planted the first orchard in Rhode Island, in 1636. In this orchard originated the "Yellow Sweeting." The Newtown Pippin came from a seedling originating on Long Island more than one hundred and fifty years ago. But a long history of apple trees is not needed here.

THE PROFITS OF RAISING APPLES.

Apples are profitable for food, prepared in a great variety of ways; they are profitable as an article for the market. The farmer can raise no other crop (every thing considered) with so large a margin of profit. Let us see if this be true or not. An orchard containing fifty trees properly set out, will cover an acre of ground; in ordinary seasons each tree ought to yield three barrels of fruit; the whole orchard will produce then, one hundred and fifty barrels of apples annually; these are worth on the spot in common seasons, one hundred and fifty dollars. An acre of grass land will produce about three tons of hay, commonly worth not more than thirty dollars at the time of cutting. The apples can be gathered with as little expense as making the hay; this will leave a large balance in favor of the orchard; aside from this, the orchard will produce in addition to the apples, a fair crop of either grass, potatoes, or oats without detriment to the trees. I might take the corn, or wheat crop, or any other, not excepting tobacco, and make the same comparison, and yet the balance (other things being equal) would still be in favor of the apples. An orchard of forty Baldwin apple trees has yielded three hundred barrels of fruit in a single season; a farmer in Leverett, two years ago, gathered one hundred and one bushels of seedling apples from a single tree, another sold two hundred and fifty dollars worth in a single season, gathered from an old orchard, covering one and one-half acres of ground. But these facts are sufficient to establish the great profits of raising the fruit under consideration.

SITUATION AND SOIL MOST SUITABLE FOR AN ORCHARD.

A side hill or gentle slope, facing the south or south-west, and sheltered in the background by a higher eminence, is a good situation for an orchard. Avoid low, flat, or over-moist

grounds with clayey subsoil, also sandy plain lands. Orchards will not flourish in such situations nor on such soils. Dark, rich, loam, intermingled with gravel, with subsoil of yellow loam intermingled with gravel, is the most proper soil for an orchard. A soil that naturally produces the oak and sugar maple, will produce a thrifty orchard. Avoid lands and locations that bear the pine or hemlock,—they will not grow an orchard.

HOW AND WHEN TO PLANT AN ORCHARD.

The best time to set out an orchard of young trees is in the spring. Let it be done early—as soon as the frosts are well out of the ground. Go to the nursery and select your trees. Be careful to get thrifty, well-formed ones of such varieties as you desire. Those of a larger size are the best. Never select any less than six or eight feet high. They are more apt to live and you will get an orchard sooner by so doing. Secure as many roots on the young trees as possible, and be careful not to wound or bruise them in taking them from the ground. The holes should be dug in well-marked rows at intervals of thirty or thirty-two feet apart. This is quite near enough for the good of both trees and land. Spade out a hole twelve inches deep and five feet or more in diameter. Cover the bottom of the hole with some well-made, rich compost, to the depth of three or four inches. Now set the tree carefully in, straightening out all the small roots and fibres, and draw in the fine dirt upon them. After all the dirt is drawn in, place over the whole the grassy turf, if on sward land, with the grass side down, and if deemed necessary, secure the tree to a stake by a piece of soft cord, or strip of cloth, and the thing is done.

THE AFTER-TREATMENT OF THE YOUNG TREES.

Do not meddle with them much the first year. If the season is a dry one they may need watering, but they will require no pruning. Young trees will bear but little pruning for a few years. They need all their foliage to gather from the atmosphere important principles of growth. After the first year, a compost, composed of well-rotted manure and wood-ashes, should be applied annually around and near them. It is an excellent plan to wash the bodies and larger limbs at least once

every season with a solution of sal-soda or of soft soap and water. This will keep off parasitic growths and destroy insects and worms. Examine them often near the ground, for the detection of that enemy of apple trees—the borer. If you find the bark penetrated by this worm, seek for it with a piece of bent annealed wire, and destroy it. Clear the leaves and twigs from worms and caterpillers as soon as you discover any. If any pruning is done, do it with a sharp knife, or fine-toothed saw, and cover the stub with a coating of grafting wax or cement.

If the land can well be cultivated, it is better for the young trees. Potatoes, corn or oats will flourish well in an orchard and give a fair crop without injuring or impairing the growth of the trees. Be careful in ploughing or cultivating, not to wound the roots, or bark, or in any way to disturb them. If the land is kept down to grass, a surface of several feet should be kept clear of turf near the body of every tree. This can easily be done with a bog-hoe or pointed shovel. Or, what is quite as effective, the same space can be covered with muck.

HOW TO RECRUIT AN OLD ORCHARD.

Many farmers have on their premises old orchards, producing very little fruit. It is desirable to make them bear, until a young orchard can be brought forward into a bearing condition. Can any thing be done to reinvigorate the old and barren trees, and to enhance their productive powers? I answer yes, and from personal experience with an old, worn-out orchard. My method, and one which proved successful, was the following. First the trees were cleared of all dead and decaying limbs with the saw. Then all the moss and old dead bark was well scraped from trunk and limbs with a sharp hoe. A quantity of turf for a space of six feet in circumference was removed with the spade from around the trunk, and one bushel of compost applied. The compost was composed of equal parts of ashes, charcoal dust, and well-made manure. Then the turf was replaced, the grass side downward. On the following year, the leaves were larger and darker green, and for a number of years the quantity and quality of the fruit was doubled.

WHAT VARIETIES OF FRUIT TO RAISE.

Any person about to plant an orchard will do well before doing so to answer the following questions: What trees will flourish best in this latitude, and on the peculiar soil of my farm? What varieties of apples will suit best the tastes of my family for home consumption? What kinds of apples will find the most ready sale in market? What varieties are the best bearers? Supposing you wish to set out an orchard of one hundred trees. Seventy-five of these at least, should be calculated to produce market fruit. The remaining twenty-five may consist of selected varieties of summer, fall, and winter fruit, adapted to the tastes and predilections of the family. Those designed for market should not reach over four varieties, and those all winter fruit. If I were to name the kinds, all things considered, as being most economical and desirable, they should be the following: Rhode Island Greening, Roxbury Russet, Baldwin, and the Newtown Pippin. These varieties are excellent bearers, and the fruit always meets with a ready sale.

HINTS ABOUT GATHERING AND STORING WINTER FRUIT.

Apples should never be shaken off from the trees. They will become bruised, and decay much the sooner. They ought to be carefully plucked off with the hand, one by one, and placed in a basket. From the basket they should be transferred to a shallow box, not over ten inches deep, in the same careful manner. Now let them stand in an outhouse or open shed until very late in the autumn. So long as they will not freeze keep them in this condition. Then in time remove the boxes, after taking out all decayed and decaying fruit, into a dry, cool cellar. Elevate the boxes on pieces of timber, a little way from the cellar bottom. Apples after being gathered should be stirred as little as possible. They never should be poured into a box or barrel, for this will bruise them. A shallow box is preferable to a barrel, as there is less pressure from above downward. And besides, the apples will keep cooler, and the decayed and decaying ones can be more easily removed.

THE APPLE AS AN ARTICLE OF FOOD, IN ITS RAW AND COOKED STATE.

Apples, eaten in their natural condition, are a palatable and healthful article of diet. They contain no inconsiderable

amount of the nutritious principle, and they are easily and quickly digested, and promote the growth and health of the body. Baked or roasted, they are excellent as a dessert, or eaten with milk and bread. Fried with butter or lard, or stewed with white sugar, they make a fine relish, eaten with fresh or salted meats. With cider molasses, they when stewed, make the old-fashioned "apple sauce," the favorite dish of our ancestors a hundred years ago. And the article when properly made is just as good now as ever. Apple pies, tarts, jellies, &c., form no mean part of the delicacies of every well-ordered pantry. The dried fruit finds a variety of uses in the hands of the skilful housewife, in the preparation of numerous delicious dishes, when the raw fruit cannot be obtained.

APPLE CIDER OR WINE.

Every latitude produces those fruits and acids conducive to the health of the inhabitants. In tropical regions, where great heat prevails, very acidulous fruits are required, and they have the lime and the lemon. In the frigid zone, where intense cold prevails, few acids are required, for the inhabitants need none. They drink the oils and eat the fatty flesh of the whale, walrus, and seal, and grow rotund and obese, and so are protected from freezing. In these "*temperate regions*," we seem to need not too much fatty food, nor too acidulated fruits or drinks. So we have the grape, cranberry, currant and apple, moderately acidulous in their character. Apple cider, the fermented juice of the apple, when properly prepared, is not only a grateful and healthful acidulous beverage, taken at proper times, and in proper quantities, but it takes the place of imported wines and brandies in the cure of many ailments incident to the human system, and peculiar in these latitudes.

In cases of indigestion, from a lack of a proper secretion of the gastric juice, it gives tone and vigor to the stomach, and helps to restore its normal functions. In the latter stages of typhoid and bilious fevers it is quite as useful as most foreign wines or brandies, and very much more so than the vile preparations palmed off upon the public, purporting to be the genuine imported articles. The sweet cider, boiled down to a syrup, enters into the composition of many delicious articles of food. Brandy distilled from the fermented wine is a pure

spirit, and useful for bathing purposes; and when old is not much inferior, in a medicinal character, to brandy distilled from grape wine. Good cider cannot be made from inferior, or decayed, or worm-eaten fruit. The apples should be ripe and mellow, before they are ground out in the mill. They should be mixed, the sour and the sweet, in about equal proportions when carried to the apple heap. After the fruit is ground in the mill the pomace should stand in the vat a day or two, being frequently stirred with a wooden shovel. Being thus brought into contact with the air the cider will have a fine rich color, and a better flavor, acquired by the digestion of the apple skins, which contain a fragrant oil, and by chemical changes wrought in the cider proper by atmospheric influences. The cider should be stored in well-cleansed barrels or casks, and put into a dry, cool cellar. After fermentation has quite ceased, the barrels or casks should be hermetically closed. No foreign substance should ever be added to cider with the idea that it can be improved or made better thereby. Those who wish to poison their cider by chemicals will bear in mind that when they do so their cider becomes a *medicinal tincture*, unfit for a beverage, or to use in any way unless prescribed by a physician. Cider will keep fit for use much longer if bottled soon after the vinous fermentation has ceased.

DAVID RICE, *Chairman.*

LEVERETT, September, 1861.

NORFOLK.

From the Report of the Committee on Farms.

Several of the committee had the pleasure of witnessing some experiments in irrigation in connection with the cultivation of pear trees, strawberries, various root crops, &c., on the farm of Artemas Newell, of Needham. The character of these experiments and their results, will be understood from the following communication, which Mr. Newell has furnished at the request of the committee.

What I have attempted to do in either of the improvements inquired about, has not been done in a very thorough manner,

although the results have been sufficiently encouraging to convince me that if the work is properly pursued, it will ultimately be of material advantage by increasing, to a large extent, the products of some of my land.

That part of my land which I judged might be improved as to its general productiveness, by both drainage and irrigation, lies between the public road on the south and a pond on its northern boundary. A portion of the land, perhaps eight or ten acres, is a dry, gravelly loam, surrounded on every side by low meadow or peat bog, the water formerly standing or running some four or five feet below the level of the highest part of the land to be irrigated; consequently it *seemed* impracticable to use the water for that purpose. The centre or highest part of the land was cultivated and three or four acres planted with pear trees, between the rows of which were planted strawberries and currants, and in some instances potatoes, carrots and other roots. The other portion of the high land was devoted to grass or grain. The pear trees were planted in rows nine feet apart each way, giving eighty-one square feet to each tree, or five hundred and thirty-seven trees to an acre. Between the rows of trees, beds were prepared for strawberries by back-furrowing *very deep* to the centre, leaving beds just three feet wide, with a hollow between each bed and row of trees for the water to run in when needed. In the centre, between the trees in the rows, a currant bush is planted, thus giving as many of these as there are of the trees.

In commencing the work, I first ascertained by levels whether I could drain the upper end of the lot, which is a deep peat bog —the surface of the mud and water there, being apparently much below the surface of any of the dry land. It was found practicable to drain it considerably by digging through the high part of the land for a distance of six hundred or eight hundred feet towards the pond on the north, but impossible to carry the water to those higher portions where irrigation was most required. To obviate that difficulty, I caused the bog or basin at the head to be made deeper and larger, by removing large quantities of muck, which was used for compost, and this excavation opened numerous additional springs. Then the water was secured by damming up all old drains leading from the pond so formed, by which means the water rose to a sufficient

height to carry it quite above the highest and driest part of the field.

I describe these preliminary proceedings with some particularity as to the details, because they embrace the most important part of the process. Without those examinations, I should hardly have known from which end of my field the water would run, although the fall was abundant when it was made available. Judging from my own somewhat limited experience and observation in these matters, I think that even a superficial examination by the aid only of a common level, will show that there are many farms in our county where irrigation can be successfully practiced with trifling expense compared with the benefits, though the owners now look on the object as impracticable for such localities. There are but few farms that have not some facilities for irrigation, if they are sought for and made available. In some cases the sources whence water may be obtained are not on the land most requiring it, but by a small amount of labor a head may be raised where a supply is found in swamps or ponds, and by channels it may be conveyed to the places where it is wanted. It is not unusual to see water carried for miles along the sides of mountains and hills for the purpose of irrigation, in countries where the benefits of the process are duly appreciated. Here, we often see a brisk stream of pure water running through a dry pasture in a crooked channel. In many cases, if proper attention were given, it could without much expense be dammed and carried along the head of the descent and spread over the whole or a great portion of the pasture during several of the spring and fall months, and, perhaps, by opening the springs, a supply might be obtained that would continue through the summer.

The eye, without any instrument, is not in all cases sufficient to show whether the ground is level or otherwise. It is often more apt to mislead than to afford a correct guide in regard to the surface of the land. Sometimes the raising of the source from which water is to be taken for irrigation, changes the course of streams. On a part of my own land where I first made the attempt to irrigate, the water in some of the channels ran east; but a change in the source causes them to run directly west, in the same channels.

My plan for distributing the water, is to convey it from the reservoir to the upper end of the pear tree lot, where it falls into an artificial channel or ditch, which extends across the lot at the ends of all the rows of trees, strawberries, &c. To that side of the ditch next the ends of the rows, is fitted a two-inch plank ten or twelve inches wide, set edgewise, and through the plank, at intervals of four feet and a half, corresponding with the distance of the rows from each other, a round drain-pipe of an inch bore is inserted, with a cork to each, by which the whole or any portion of them may be closed when desired. Each row of trees, strawberries, &c., is thus supplied with an equal quantity of water. When the water has run down the whole length of the rows, it falls into a similar ditch as that at the upper end, and is from thence distributed over the grass field below, or let into a reservoir in which is put strong manure, for the purpose of making liquid manure, which is distributed in rivulets over the mowing land—a method of *spreading* manure which is found to be of great advantage, and requiring little labor.

That part of the water which is not taken into the head pipes as it passes, (and this is much the largest part,) falls into a channel which conducts it to another pear tree lot arranged with strawberry beds, where a part of it is turned through channels between the rows, as before described, and a part runs into an artificial fish-pond, the out-flow of which is conducted to a small workshop in the garden, and by means of an over-shot water wheel, six feet in diameter, turns grindstones, works a turning-lathe, circular saw, hay-cutting machine, corn-sheller, pump, &c., &c.

In regard to some of the effects of irrigation, I consider the hay crop more than doubled by water alone, without the application of liquid or other manure.

The pear trees, which are mostly on quince stocks, were imported from France; part of them planted in the spring of 1857, and the other part, from the same nursery, in the spring of 1859. They were two years from the bud. The principal fertilizer they have received is the water applied by irrigation, as before described. On some parts of the grounds the irrigation has been more thorough than on others. Under such circumstances the trees have made more than twice the growth of wood. The difference between those which have been *well*

irrigated and those which have not, can be seen almost as far as the trees can be seen—the size and luxuriance being so much in favor of the former. The best trees are where there is irrigation on the surface and drain pipes laid directly under them, four feet below.

Strawberries I plant between the rows of pear trees, in deep, light beds three feet wide only. By this arrangement the soil is never trodden down either in planting, weeding, trimming, or picking the fruit, and they are much more easily kept free from weeds. The beds are liberally supplied with strong manure, placed in one deep furrow in the centre of the bed, at least one foot below the surface. One row of plants is set directly over the manure, the plants fifteen to eighteen inches apart. They are set in the month of May. The hole for the plant is made with a tool like a marlinspike, reaching down well into the manure. The roots are let down and the hole is carefully filled with fine earth without pressing, then soaked with water, and dry earth placed over top to prevent baking. The effect of placing the manure so deep, is to carry the roots of the plants through the manure to the soil in a dry time, to entirely cover the beds by autumn with most vigorous plants, and to keep the seeds of weeds and grass so low that they will do no harm. The fruit is mostly grown on the new plants, which have derived their vigor from the manure chiefly through the roots of the original plant, the runners from which are cut off in the spring for the convenience of weeding, &c.

Most of my strawberry-beds are watered liberally, by a constant flow of water along the channels, which have been described. The results are, that the berries are large and fair; they do not ripen quite as early, but continue in bearing much longer; the crop is certain, even in the dryest seasons, when those on dry land under ordinary management are cut off—sometimes before half the crop is matured. In fact, I deem irrigation almost indispensable for the successful cultivation of strawberries in dry seasons. We seldom find wild strawberries on very dry land; they are found most luxuriant on moist land, which is an indication of the natural wants of the plant.

Those members of the committee who had the opportunity of going over Mr. Newell's grounds—and some of them repeated

their visit—can bear witness to the flourishing condition of the pear trees, to the great productiveness of the strawberries, and the long time the fruit continued to be produced. It was the opinion of those who saw them that they had never seen vines so loaded with fruit. The chairman visited the field after most of the strawberry vines in the neighborhood had ceased bearing, a pretty sharp drought having set in, and found Mr. Newell's vines still loaded with fruit in all stages, from the blossom to perfect ripeness. The young berries appeared to be swelling, and from the fresh and vigorous character of the vines, seemed in a fair way to mature perfectly, which, as Mr. Newell has stated, was the result.

The committee regard the experiments of Mr. Newell as of no ordinary interest, and they desire to express their thanks for his kindness in explaining the processes which he has adopted in irrigation, the results of which, in his case, increase, in an important degree, the evidence in favor of that practice. In the report of 1860, we took occasion to speak of irrigation as a subject to which the attention of our farmers ought to be more particularly directed than it has hitherto been, inasmuch as it furnishes, in many instances, the cheapest means of increasing the yield of crops. We trust that the examples which we have brought forward, will have the effect to stir up the minds of our farmers to the benefits they may derive by the adoption of this mode of fertilization.

SANFORD HOWARD, *Chairman.*

WINE-MAKING.

MIDDLESEX.

Statement of E. W. Bull.

PROCESS OF WINE-MAKING.—Domestic wines made from the small fruit, have been made in New England for a long time, and when well made, are very wholesome and palatable. I have tasted of currant wine—old and fine—equal or very nearly so, to fine Sicily Madeira. With these we do not propose to deal at this time, but to show that even in the rugged climate

of Massachusetts, wine from the grape is much superior to that from the currant, in quality, and invaluable in cases of sickness or debility. It can be made without difficulty if certain plain rules are observed, and the kind of grape used is adapted to the making of a good wine.

It is not always that a fine table grape will make a good wine; indeed there are many excellent wine grapes which are unfit for the table, and many of the finest table grapes are unfit for wine. A good wine grape should give an abundant juice of a good color, with astringency enough to give character and tone to the wine, but not so much as to give it a disagreeable flavor. It should contain sugar enough to make the wine keep well, but this is not indispensable, for sugar may be added if the grape possess the other qualities proper to a good wine.

I will state the method I pursue in making wine from grapes containing the proper qualities for that purpose, and will show in another place by what methods excessive harshness may be ameliorated, and unpleasant flavors removed, or so qualified as to yield a palatable and wholesome wine.

The first necessity in wine-making is to prepare your casks. These should not be new, for the new wood would give an unpleasant flavor to the wine. It is better to use casks which have already held wine or spirit; they should be perfectly clean and sweet, well made and strong. The press—which should be a strong screw press—must be perfectly clean, and care must be taken to keep it so during the whole process. Few grapes are so tender as to yield their juice without bruising; you will therefore need a mash-tub and a long wooden pestle to break them. I do not strip the grapes from the stems, for I believe they give to the wine a tonic property and make it keep well. The grapes should be gathered in a dry day; gather and press them as rapidly as possible, remembering that fermentation never goes back, and it is important to have the whole body of your wine start at one time if possible, lest a portion of them must grow sour before the rest is fermented into proper wine. The grapes should be ripe, but not over ripe; green berries should be removed; they give to the wine a sour taste which is a long time in passing away. A bushel of grapes should give four gallons of juice; but few grapes, however, yield so much as this, the product varying from two and one-

half to four gallons. If, however, they are rich in wine-making properties, the measure may be made up to four gallons by the addition of water and sugar. Sugar must be added to the must from grapes grown in this latitude, for, although a sound light wine may be made from some of our best wine grapes, the proportion is never sufficient to make a full-bodied wine which will keep well; twenty-four per cent. is the least the new beginner should allow, but twenty per cent. and even fifteen per cent. will enable a skilful operator to make a sound wine; the sugar should be the best refined white, as brown sugars give a coarse taste to the wine. If you have not got a proper instrument to ascertain the per cent. of sugar contained in the must, (Oechsle's must scale is the best,) add the sugar until the must will float a new laid egg with about one-quarter of its diameter above the surface. It is much better to have a little excess of sugar than to take the venture of the wine running into acetous fermentation for want of enough sugar to save it.

Fermentation, as I have said, never goes back, but it is liable to fluctuations through changes of temperature; you should therefore, if possible, have the temperature under control; this can only be accomplished by having a stove in the pressing room; with the aid of this you may keep the heat at the point necessary to secure active fermentation—and it should always be active—and to gradually increase the temperature to eighty degrees or eighty-five degrees at the close, bearing in mind that the more active the fermentation, ("stormy," a German friend calls it,) the sooner it will be completed and the better will be the wine; keep the air from the must as much as possible, and when the fermentation subsides put in the bung, and if there is any strain on the cask, relieve it by taking out the spigot occasionally; after the wine is still, keep it as cool as you can until it is convenient to put it into your cellar; take this occasion to draw it off from the lees; throw these away, rinse out the cask and replace the wine; if the fermentation has been thorough, the wine will probably be clear; if otherwise, it will be likely to ferment again in the spring, when it must be again racked off, and if necessary, fined.

To refine wine you may use isinglass or the white of an egg; one-quarter of a pound of isinglass is sufficient for a barrel of wine; dissolve it in a little hot water and mix it with five or

six gallons of the wine which you have drawn from the cask for that purpose; then return it to the cask, stirring it well into the wine and stop the cask tightly; in a week or two it will be perfectly fine, then draw it off, throw away the lees and return the wine to the cask. If you use the white of eggs, take seven eggs for a barrel of wine, whip the whites thoroughly, mix with the wine as above, whipping it with a clean whisk and return to the cask. The wine is now made and should be kept in the cask until ripe. It will be fit to use in two years, but will improve with age. It should not be bottled, that is, it should not be taken out of wood, where it ripens much more rapidly than in glass, unless it is so light as to make it necessary in order to save it from going sour.

I now propose to show by what methods the harsh flavor—commonly called foxy—of our wild grapes may be ameliorated and a good wine obtained from them.

The wild grape contains much more acid and a tougher and more mucilaginous pulp than the wine grape. The excess of mucilage causes a violent fermentation which it is difficult to check, and it is necessary to dilute the acid to make a palatable wine. The proportions of acid, sugar and water which are found to give the best wines are as follows: in one thousand parts, two hundred and forty sugar, six acids, seven hundred and fifty-four water. All these proportions fail in the wild grape. It contains more acid, less water and less sugar. With the aid of proper instruments and experience in the manipulations, one can restore these proportions exactly; but as this article is written for those who have neither time nor inclination for critical experiments, but who would be glad to be able to make a good and wholesome wine out of the wild grapes of their fields, I offer to them the following formula: To every gallon of the grape juice add a gallon of pure water; take the cheese or pressing from the press and restore it to the mash-tub and bruise it thoroughly again; then add to it as much water as you got pure juice from it at the first pressing; let it stand an hour or two and press again, then put the liquid into your cask with the first pressing and the water which you had added to it; to every gallon of this mixture add three pounds of the best white sugar—let this be dissolved in the water before you add it to the grape juice—and give it a thorough fermentation;

keep your cask full, if possible, and let the yeasty substance work over at the bung, for this is the best way to get rid of the excess of mucilage, taking care to fill up the cask frequently with the must saved for that purpose. If, however, you have not a sufficient quantity of must to fill your cask and supply the waste from the bung, the following method may be adopted: Take strips of cotton cloth, half an inch wide and twelve or fifteen inches long, wet them and dip them in flour of sulphur, light them at one end and put them into the cask, one end being secured at the bung; when the cask is filled with the vapors of the sulphur, pour in the must until the cask is about one-third full; put in the bung and roll the cask until the vapor is thoroughly mixed with the wine; repeat the process until all the must is in the cask; this will throw down the mucilage and coloring matter in which is contained the offensive taste and odor; as soon as this takes place, which will be in two or three days, draw off the must carefully, clean out the cask, replace the wine, and proceed with the fermentation as stated above.

Concord, December 1, 1861.

BREAD.

MIDDLESEX.

From the Report of the Committee.

The quality of most of the bread was good, a large proportion being very fine. There were some wheaten loaves, the flour wet with new milk, which were in their new state all that could reasonably be desired, but the committee feared they would not retain their nice flavor so long as bread mixed with water. We recommend a trial of it to those who can spare time to bake often, and will insure a very nice article to all who have good materials and Mrs. ——'s skill, if they will work after her mode. She "used four pounds of flour, one cup of yeast, teaspoonful of salt; wet the flour with new milk; put in a warm place to rise three hours, then kneaded and allowed to

rise one hour; again kneaded, and placed in pans for baking. After standing half an hour, it was baked in a brick oven one hour."

Good flour, good yeast, a good oven, and some experience and native skill, are essential to the production of good bread. Great skill may succeed in making a tolerable bread from poor materials; and one without skill may sometimes, with good materials, find that she has made a good loaf; but if she cannot make the next one like it she has much to learn. What we strongly desire is, to see the work done in an intelligent manner, according to sure principles of science, so that no failure is to be counted as among the probabilities. This can be brought about only by the education of the bread maker in a knowledge of the process of mixing, kneading, fermentation and baking of bread, so that the how and why of every part shall be well understood. The practical part of this education can be best secured in that divinely established seminary, the family kitchen, under the instruction of an intelligent mother.

Flour of the best quality is of a light cream color, and holds together in a lump when squeezed by the hand, and shows impressions of the fingers, and even marks of the skin, much longer than that which is inferior. It contains from twelve to fifteen per cent. of gluten, fifty-five to sixty of starch, eight of sugar, five of gum, and twelve of water; these proportions varying considerably in different varieties of wheat and qualities of flour. The whitest flours contain most starch, and the darkest most gluten; so that, gluten being the flesh-forming substance, whiteness is not an indication of superior nutritiveness, but rather the reverse. Bakers prefer to mix flour abounding in starch with that which contains a larger proportion of gluten, believing they can by the mixture make a better bread than by either alone; though possibly their preference may sometimes arise from the fact that they are thus enabled to work in flour of a lower price. Many growers of wheat in the West sow two varieties together, say the Fife and the Rio Grande, and get a better flour by the mixture.

In the making of bread, the proportion of water to be added in mixing the dough varies according to the quality of the flour. The best flours, those that contain the largest proportion of gluten, will absorb more than those of inferior quality. The

water thus added to flour enters into intimate combination with its constituents, and but little of it is expelled by the heat to which it is exposed in baking. Bread that has been removed from the oven several hours, has been found to contain about forty-five per cent. of water, and the proportion is but slightly lessened by age. As what we call dry flour contains about twelve per cent. of water, there will therefore remain of the water that was added in the preparation of the dough, about thirty-five per cent., or a little more than one-third of the whole weight of bread. The water thus intermingled with the flour combines with the starch, dissolves the sugar and gluten, and moistens the minute particles so as to cause them to cement together, binding the whole into a coherent mass. It also serves to bring the ingredients into that closer contact which is favorable to chemical activity. The proper quantity of water to be used is so much as will give to the gluten the greatest degree of tenacity; experience shows this to be about a half pint to a pound of flour.

A mixture of plain flour and water makes a substance which, when baked, is hard and tough, and difficult to masticate and digest. To remedy this defect, and give the bread a loose and spongy texture, which enables it better to mingle with the digestive juices of the stomach, the dough is subjected to certain operations which we call *raising*. When softened by water, the glutinous parts of the flour become elastic, and thus the whole mass is rendered capable of greatly expanding. To produce this desirable expansion, fermentation is usually employed. While the vinous fermentation is going on, the sugar of the flour is changed to alcohol and carbonic acid gas. The particles of sugar being evenly distributed through the mass, wherever the fermentation is sufficiently active, the liberated gas forms little cells for itself in the elastic dough; and the gas bubbles, being confined by the toughness of the gluten in the spot where they are generated, expand or raise the whole lump, giving it the requisite lightness. All rising of bread depends upon this principle—there must be minute bubbles of gas liberated evenly in all parts of the dough. In all modes of fermentation, in all combinations of alkali and acid, the result is effected in the same way.

As an agent to excite fermentation, *yeast* in some one of its many forms, is in this country more generally used than any other. The active principle of yeast, and how it acts to chemically decompose the sugar of the flour so as to liberate the gas, has ever been a mystery. The microscope has yet been able to show little beyond the fact that it belongs to the vegetable kingdom—that it is a plant of the fungus tribe. Under a powerful magnifier, it is seen to consist of innumerable rounded or oval bodies, which are the true vegetable cells. Each little globule consists of an enveloping skin or membrane, containing a liquid within. When placed in favorable circumstances, these globules, each containing within itself the seminal principle, are rapidly multiplied by budding off from each other, and so the plant is built up, and somehow its growth disturbs the combination of elements that make up the sugar, and the carbonic acid gas is set free.

The most common form in which yeast has been made and kept, is that of a liquid. In making yeast, the brewer is accustomed to use malted grain, barley being preferred. The grain is moistened and kept warm till it begins to sprout. In this operation a chemical change takes place by which a portion of the starch is changed to sugar. It is then dried, and the process is stopped. In this state the grain is called malt. It is next crushed and soaked in warm water, at a temperature of about 160 degrees, to extract the soluble matter it contains. Hops are then added, and the liquid is boiled to coagulate the excess of gluten; and when again cooled yeast is added, and the mixture is left to ferment. The malt gives strength and activity to the yeast; the hops serve to check the fermentation before all the sugar is changed to alcohol, and to delay the production of acid.

But it has been found that yeast may be more conveniently preserved by drying; and manufactories of dry yeast are now established in various places, and it is thus easy to procure a good article with but little trouble. But many persons prefer to make it for themselves, and it is easily prepared in this way: boil three ounces of dry hops half an hour in a gallon of water, and strain the liquid through a fine sieve into an earthen vessel. While hot, stir in two quarts of wheaten or rye meal. When lukewarm, add a half-pint of good yeast and let it stand

in a moderately warm place till it becomes light. Then add Indian meal enough to make a stiff dough, knead thoroughly, roll it out about a third of an inch thick, and cut into cakes two inches square, dry in the sun, taking care to turn every day and protect from wet. Yeast prepared in this way will remain good a long time if kept in a dry place.

Active yeast for immediate use may be made in this way: boil and mash six good sized potatoes and strain them through a coarse sieve or colander ; add a quart of boiling water, and stir in a half-pint of flour and a tablespoonful of sugar. When lukewarm add a cake of the above dry yeast after soaking in warm water till soft. Set in a warm place till it becomes light. It is then ready for use, and will remain good for two weeks if kept in a cool place.

The yeast being now ready, the operator begins to make her bread. She first decides how large a batch her family needs. Only so much should be baked at one time as is sure to be used before it becomes sour or mouldy. This quantity will vary according to the season of the year. In cool weather bread will remain sweet much longer than in summer. Ten pounds of flour, mixed with three quarts of water, will make about fifteen pounds of bread, and in about that proportion for a larger or smaller quantity. The good housewife takes the needful quantity of warm water, and stirs in flour enough to make a thin batter ; adds for the above amount a tablespoonful of salt and a pint of yeast like that described above, and sets where it will keep warm till it becomes light. The remaining flour is then added, and the dough is set in a warm place to rise. It should be kept about lukewarm. When nearly double its original bulk it should be well kneaded, and put in the baking pans, and stand in a warm place from fifteen to thirty minutes, or till it begins to rise again, and then put into a hot oven, and baked about one hour. It is well to manage so that the heat of the oven may gradually diminish during the baking. Much depends on the temperature of the oven. If the heat be insufficient, the bread is sure to be soft and pasty in the interior ; and if it be too great, the loaf gets a hard burnt crust, and may seem to be well done while the middle is still doughy. When the temperature is right, however, the loaf is thoroughly cooked without the formation of a thick crust.

The baking temperature of the oven should not vary much from 400 degrees Fahrenheit. In the absence of a suitable thermometer, the simplest way to try the heat is to sprinkle a little dry flour on the bottom of the oven. If the flour turns brown the heat is right, but if it be blackened and charred the heat is too great. We much prefer a good old-fashioned brick oven, especially for brown bread. The bread is more likely to get a good bake without being scorched, than in a narrow stove oven. But customs are changing, and we must learn to manage the stove so as to do good work.

Instead of setting a sponge, many good housewives prefer to make the dough of the requisite stiffness at once; and indeed some of the best bread exhibited was made in this way. In fact it seems to make but little difference which method is pursued. The most difficult part of the work is to decide just when the fermentation has proceeded far enough; and this, we think, is less difficult, or does not require the exercise of so nice a judgment, when the sponge method is followed as in the other mode. This, however, may be a matter of mere habit; and if one has, by experience, acquired that sure nicety of judgment in either mode, to her that mode is the best.

For the committee,

MINOT PRATT.

CONCORD, September 19, 1861.

AGRICULTURAL STATISTICS

OF MASSACHUSETTS,

ARRANGED BY TOWNS AND COUNTIES.

COMPILED FROM THE

UNITED STATES CENSUS OF 1860,

AND OTHER OFFICIAL SOURCES,

UNDER THE DIRECTION OF THE

STATE BOARD OF AGRICULTURE.

Counties and Towns.	Farms.	Farmers.	Farm Laborers.	Improved land, (acres.)	Unimproved land, (acres.)	Value of Farms.	Value of Farm Implements & Machinery.	Horses.	Asses and Mules.	Milch Cows.	Working Oxen.	Other Cattle.	Sheep.	Swine.
Barnstable Co.														
Barnstable, . .	194	149	–	7,435	8,063	$501,980	$20,745	199	1	411	116	373	381	337
Brewster, . . .	21	101	–	550	142	25,560	1,252	27	–	39	16	33	–	25
Chatham, . . .	46	81	–	1,359	688	74,259	3,935	58	–	100	6	99	2	61
Dennis, . . .	89	124	–	2,115	1,656	208,280	8,853	78	–	151	64	108	–	115
District of Marshpee,	15	15	–	179	1,727	21,186	610	10	–	24	24	33	9	24
Eastham, . . .	71	83	1	1,941	1,036	97,183	3,273	95	–	147	–	201	–	100
Falmouth, . .	142	177	–	6,148	9,663	368,178	14,355	153	–	317	104	261	677	238
Harwich, . . .	29	119	1	770	1,212	61,900	1,915	31	–	43	4	33	20	39
Orleans, . . .	64	115	–	2,115	970	93,895	4,056	81	–	133	2	188	79	86
Provincetown, . .	–	3	–	–	–	–	–	–	–	–	–	–	–	–
Sandwich, . .	153	208	1	8,347	16,763	406,175	13,813	178	1	411	161	383	282	240
Truro, . . .	16	42	–	757	410	18,300	932	18	–	59	2	39	–	20
Wellfleet, . .	6	11	1	262	185	11,300	310	10	–	11	–	33	–	6
Yarmouth, . .	62	72	–	1,706	2,098	138,710	6,805	69	3	126	27	63	5	79
Totals, . .	908	1,333	4	33,714	44,613	$2,027,206	$80,854	1,007	5	2,008	529	1,847	1,157	1,370

BERKSHIRE CO.															
Adams, . . .	139	194	77	13,471	6,914	$643,300	$19,474	221	–	1,095	74	581	1,726	434
Alford, . . .	48	56	38	4,257	1,818	137,500	4,500	90	–	208	31	174	666	174
Becket, . . .	104	186	46	10,842	7,991	212,300	7,893	156	–	521	186	733	797	116
Cheshire, . . .	80	129	127	9,799	3,299	308,225	8,005	143	–	958	68	337	385	198
Clarksburg, . .	40	53	9	2,211	2,294	82,375	3,115	48	–	127	28	115	31	72
Dalton, . . .	53	66	113	5,615	2,744	190,400	7,115	91	–	244	62	215	1,001	105
Egremont, . .	95	109	68	7,585	3,516	456,054	14,197	197	–	475	84	379	531	559
Florida, . . .	78	67	38	5,683	7,249	131,975	5,755	98	–	301	107	393	771	179
Great Barrington, .	141	181	37	11,924	7,186	611,100	12,616	286	–	643	146	562	1,245	402
Hancock, . . .	31	79	21	4,330	1,994	142,300	6,913	66	–	207	40	186	1,112	89
Hinsdale, . . .	80	128	80	10,353	3,691	324,300	10,485	144	–	438	104	625	4,287	1,682
Lanesborough, . .	80	145	96	10,721	3,016	354,244	9,010	185	–	588	69	351	3,826	165
Lee, . . .	106	111	81	9,662	4,632	457,628	14,775	193	–	568	136	392	639	248
Lenox, . . .	102	147	50	7,558	2,798	422,350	10,645	190	–	442	79	486	700	130
Monterey, . .	90	96	48	8,016	5,924	198,550	7,265	130	–	705	148	423	406	247
Mount Washington, .	22	28	1	2,405	2,568	42,220	980	32	–	136	21	80	94	62
New Ashford, . .	30	40	23	3,895	1,866	68,600	2,725	56	–	225	30	119	929	57
New Marlborough, .	161	195	51	14,513	9,158	355,600	12,380	231	–	1163	179	727	916	422
Otis, . . .	125	137	24	15,171	5,555	220,502	9,670	143	–	585	219	500	434	160
Peru, . . .	71	83	43	8,794	3,493	141,310	6,658	89	–	533	90	385	1,157	181

Counties and Towns.	Value of Live Stock.	Wheat, (bush.)	Rye, (bushels.)	Indian Corn, (bushels.)	Oats, (bushels.)	Tobacco, (lbs.)	Wool, (lbs.)	Pease and Beans, (bushels.)	Irish Potatoes, (bushels.)	Sweet Potatoes.	Barley, (bushels.)	Buckwheat, (bushels.)	Value of Orchard Products.	Wine, (gallons.)
Barnstable—*Con.*														
Barnstable, . .	$16,448	536	1,923	9,216	2,067	–	751	425	6,807	10	271	45	$208	21
Brewster, . . .	6,255	17	42	931	232	–	–	20	539	–	166	–	90	–
Chatham, . . .	9,887	2	445	2,850	598	–	11	45	1,395	–	232	–	–	–
Dennis, . . .	16,818	91	523	4,211	266	–	–	117	2,471	–	298	–	20	–
District of Marshpee,	2,608	20	241	660	67	–	21	73	503	–	76	8	–	–
Eastham, . . .	14,630	71	1,579	4,740	300	–	–	119	2,238	–	25	–	1,050	–
Falmouth, . .	31,309	427	816	6,249	960	–	1,128	333	3,487	–	1,642	101	194	9
Harwich, . . .	5,250	17	377	1,318	170	–	150	29	724	–	–	10	–	–
Orleans, . . .	13,674	31	1,089	5,580	2,699	–	226	76	1,661	–	261	–	22	–
Provincetown, . .	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Sandwich, . .	40,606	128	1,966	9,400	1,471	–	618	244	8,221	30	421	10	635	–
Truro, . . .	3,688	–	199	757	–	–	–	19	870	–	–	–	60	200
Wellfleet, . .	1,479	–	87	234	–	–	–	14	290	–	–	–	265	–
Yarmouth, . .	13,920	93	946	3,311	276	–	12	128	1,720	–	–	–	100	43
Totals, . . .	$209,572	1,433	10,233	49,460	9,106	–	2,917	1,642	30,926	40	3,392	174	$2,644	273

BERKSHIRE—*Con.*														
Adams, . . .	$75,656	382	440	8,973	12,715	–	6,548	58	14,296	–	1,474	260	$331	65
Alford, . . .	24,652	145	2,005	5,308	10,165	–	4,512	12	5,115	–	60	1,467	601	106
Becket, . . .	57,167	146	80	1,042	3,087	–	2,610	12	13,735	–	50	332	368	–
Cheshire, . . .	49,900	227	718	3,520	11,102	3,400	11,826	75	10,560	–	756	629	145	–
Clarksburg, . .	12,131	32	150	835	2,180	–	189	51	4,960	–	–	164	212	9
Dalton, . . .	28,012	123	1,030	1,847	4,121	–	3,228	91	8,170	–	41	512	155	–
Egremont, . .	55,047	219	7,228	13,425	19,751	25	2,697	70	8,190	–	330	2,747	966	182
Florida, . . .	28,682	193	63	1,492	2,974	–	2,570	26	12,354	–	3	430	342	3
Great Barrington, .	83,009	412	7,893	16,556	32,213	–	9,131	107	14,383	–	–	3,455	2,975	89
Hancock, . . .	20,172	119	267	1,390	4,483	–	3,878	47	3,025	–	122	234	284	3
Hinsdale, . . .	51,954	1,083	89	1,110	2,521	–	13,754	15	13,245	–	256	553	100	–
Lanesborough, . .	55,566	327	808	4,214	14,361	–	12,932	25	7,995	–	133	2,020	60	–
Lee, ...	55,609	479	2,893	12,953	17,590	–	1,961	971	19,645	–	143	1,908	3,430	–
Lenox, . . .	46,161	441	1,318	6,066	11,910	–	2,446	69	7,948	–	107	1,148	708	–
Monterey, . .	53,250	139	1,501	2,780	9,407	–	1,225	6	8,950	–	–	1,911	148	12
Mt. Washington, .	8,787	33	694	369	2,711	–	205	–	3,960	–	–	912	–	–
New Ashford, . .	17,263	101	95	905	3,483	–	2,944	–	4,080	–	15	220	105	–
New Marlborough, .	84,667	1,605	4,276	8,821	16,269	–	4,216	–	13,410	–	–	2,966	1,541	27
Otis, . . .	55,069	375	131	2,800	6,970	–	1,422	53	16,163	–	55	825	1,305	–
Peru, . . .	36,913	198	–	614	1,666	–	4,708	3	9,366	–	230	877	184	8

Counties and Towns.	Value of Produce Market Gardens.	Butter, (lbs.)	Cheese, (lbs.)	Hay, (tons.)	Clover Seed, (bushels.)	Grass Seeds, (bushels.)	Hops, (lbs.)	Flax, (lbs.)	Flaxseed, (bush.)	Maple Sugar, (lbs.)	Maple Molasses, (gallons.)	Beeswax, (lbs.)	Honey, (lbs.)	Value of Slaughtered Animals.
Barnstable—*Con.*														
Barnstable, . .	$3,968	4,333	690	2,547	–	3	–	–	–	–	–	–	–	$11,639
Brewster, . . .	–	2,335	–	202	–	–	–	–	–	–	–	–	–	1,180
Chatham, . . .	96	4,457	100	572	–	–	–	–	–	–	–	–	–	4,016
Dennis, . . .	660	6,408	–	893	–	–	–	–	–	–	–	–	–	5,284
District of Marshpee,	150	1,715	150	111	–	–	–	–	–	–	–	–	–	499
Eastham, . . .	540	9,755	–	916	–	–	–	–	–	–	–	–	–	–
Falmouth, . .	4,458	14,840	2,315	1,332	–	1	–	–	–	–	–	–	55	8,325
Harwich, . . .	–	1,980	10	256	–	–	–	–	–	–	–	–	–	1,400
Orleans, . . .	27	5,674	–	733	–	5	–	–	–	–	–	–	–	4,633
Provincetown, . .	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Sandwich, . .	20	17,682	1,597	2,615	–	12	–	–	–	–	–	–	120	13,981
Truro, . . .	721	730	15	191	–	–	–	–	–	–	–	–	–	–
Wellfleet, . .	75	1,025	–	78	–	–	–	–	–	–	–	–	–	–
Yarmouth, . .	936	5,490	–	672	–	–	–	–	–	–	–	–	–	2,988
Totals, . . .	$11,651	76,424	4,877	11,118	–	21	–	–	–	–	–	–	175	$53,915

BERKSHIRE—*Con.*														
Adams,	–	60,517	281,025	4,702	–	10	–	–	–	4,510	215	108	88	$13,370
Alford,	–	26,275	2,970	1,115	–	–	–	–	–	121	29	–	228	4,448
Becket,	–	31,678	23,815	3,194	–	–	–	–	–	11,538	152	24	300	8,120
Cheshire,	–	31,950	308,200	3,193	–	10	19,200	–	–	16,000	166	65	600	7,440
Clarksburg,	$19	12,650	1,230	680	–	2	–	–	–	910	13	8	318	231
Dalton,	210	21,290	5,010	1,689	–	6	–	–	–	1,700	66	20	800	4,719
Egremont,	–	66,730	8,990	2,420	9	6	6,000	15	2	–	–	61	715	11,791
Florida,	25	33,875	9,415	1,965	–	5	–	–	–	21,071	75	37	495	6,244
Great Barrington,	–	76,730	20,360	3,857	5	30	–	–	–	–	6	38	1,450	14,902
Hancock,	3,800	19,685	25,900	1,133	–	2	34	–	–	180	9	–	110	3,572
Hinsdale,	–	37,170	23,080	3,208	–	–	–	–	–	12,300	–	20	350	5,807
Lanesborough,	100	29,450	108,631	3,281	–	2	–	–	–	15,050	27	–	200	7,150
Lee,	1,885	58,320	32,270	3,451	–	31	–	–	–	625	214	65	1,880	29,852
Lenox,	200	33,360	13,544	2,695	–	–	–	–	–	1,750	448	35	315	10,954
Monterey,	–	44,450	81,090	2,553	–	16	–	–	–	15,324	314	8	267	7,405
Mt. Washington,	–	12,790	–	500	–	–	–	–	–	115	7	15	170	1,174
New Ashford,	–	9,700	34,500	910	–	–	–	–	–	6,500	–	200	550	1,735
New Marlborough,	–	74,911	186,100	4,524	–	5	–	–	–	16,360	278	–	1,016	15,115
Otis,	–	33,780	72,275	3,119	–	–	–	–	–	24,075	378	6	300	5,523
Peru,	10	60,181	29,181	2,405	–	–	–	–	–	11,257	138	–	–	4,861

Counties and Towns.	Farms.	Farmers.	Farm Laborers.	Improved land, (acres.)	Unimproved land, (acres.)	Value of Farms.	Value of Farm Implements & Machinery.	Horses.	Asses and Mules.	Milch Cows.	Working Oxen.	Other Cattle.	Sheep.	Swine.
Berkshire—*Con.*														
Pittsfield, . . .	137	242	202	12,814	2,837	$742,275	$15,515	302	–	617	65	562	1,952	191
Richmond, . .	86	123	39	8,502	2,206	369,065	8,694	196	–	350	61	312	2,749	115
Sandisfield, . .	160	195	46	23,304	5,892	346,240	13,977	233	–	1,268	228	714	311	254
Savoy, . . .	128	224	90	8,221	7,754	176,937	8,817	134	–	602	133	339	726	264
Sheffield, . . .	190	226	126	16,936	9,291	712,460	20,262	368	1	1,117	220	1,056	1,185	833
Stockbridge, . .	134	110	91	8,440	3,962	587,030	14,865	257	2	408	108	456	1,359	253
Tyringham, . .	47	76	27	5,969	3,637	154,100	5,265	69	–	406	100	395	303	112
Washington, . .	82	115	82	9,846	4,845	191,150	7,850	121	–	369	110	446	826	115
West Stockbridge, .	108	105	48	6,764	3,157	351,230	15,099	201	–	310	50	234	2,363	177
Williamstown, . .	138	166	22	13,806	6,190	451,020	19,235	280	–	763	57	417	6,289	388
Windsor, . . .	122	125	78	12,409	5,991	261,316	13,203	159	–	964	114	585	1,714	317
Totals, . . .	3,008	3,967	1,925	293,816	143,471	$9,819,656	$316,988	5,112	3	17,366	3,183	13,279	41,436	8,764
Bristol County.														
Acushnet, . .	126	111	56	3,518	5,037	$346,750	$11,976	148	–	318	40	256	119	294
Attleborough, . .	204	291	187	8,674	8,034	578,900	20,456	250	–	659	190	306	25	330

Berkley,	64	129	4	2,615	2,061	$120,075	$9,333	71	–	180	56	109	205	148
Dartmouth,	234	304	201	9,757	13,277	870,750	21,297	276	2	847	336	311	629	397
Dighton,	77	181	6	2,704	3,525	210,770	6,688	82	–	186	64	113	56	201
Easton,	95	148	77	4,203	4,581	287,150	9,930	93	–	282	110	141	31	174
Fairhaven,	110	125	22	1,868	3,200	273,280	8,942	92	–	174	66	98	99	220
Fall River,	75	165	61	1,223	4,617	110,000	4,193	66	–	237	86	127	122	261
Freetown,	52	114	31	2,332	4,051	158,300	3,515	50	–	127	57	100	222	85
Mansfield,	87	138	50	3,683	2,700	199,050	6,105	103	–	196	70	80	5	135
New Bedford,	61	100	78	1,944	2,302	424,300	9,945	72	–	192	52	69	11	93
Norton,	123	205	59	5,413	5,731	277,650	9,123	137	–	318	142	166	45	209
Pawtucket,	10	55	6	286	282	58,500	700	17	–	35	4	20	–	16
Raynham,	116	173	7	3,898	23,244	322,545	16,705	146	–	305	120	110	109	193
Rehoboth,	107	302	37	4,708	5,414	293,300	7,475	136	–	389	109	231	163	297
Seekonk,	130	270	63	6,211	4,106	439,000	13,520	190	–	601	152	245	50	351
Somerset,	50	113	16	2,841	1,001	214,600	7,230	64	–	196	92	167	225	246
Swanzey,	100	231	18	4,918	3,119	286,850	8,255	107	–	319	120	275	229	402
Taunton,	228	446	6	8,107	11,425	690,715	33,325	342	–	703	214	252	157	631
Westport,	159	336	156	5,253	8,900	454,855	12,847	182	–	520	253	299	656	403
Totals,	2,298	3,970	1,111	84,156	116,607	$6,617,940	$221,560	2,624	2	6,784	2,333	3,475	3,158	5,066

Counties and Towns.	Value of Live Stock.	Wheat, (bush.)	Rye, (bushels.)	Indian Corn, (bushels.)	Oats, (bushels.)	Tobacco, (lbs.)	Wool, (lbs.)	Pease and Beans, (bushels.)	Irish Potatoes, (bushels.)	Sweet Potatoes.	Barley, (bushels.)	Buckwheat, (bushels.)	Value of Orchard Products.	Wine, (gallons.)
Berkshire—*Con.*														
Pittsfield,	$74,291	188	3,929	7,070	15,963	–	6,007	257	11,742	–	789	1,348	$562	–
Richmond,	41,101	416	1,056	3,199	12,104	–	9,085	262	7,824	–	219	1,381	153	–
Sandisfield,	90,241	458	425	5,975	9,871	–	524	38	21,275	–	–	602	1,893	–
Savoy,	42,221	322	51	1,022	3,803	–	2,379	8	22,855	–	158	522	115	6
Sheffield,	116,375	2,069	15,223	22,217	41,561	–	4,111	12	18,196	–	150	6,313	2,599	60
Stockbridge,	61,336	535	3,165	15,217	20,600	–	4,941	407	16,580	–	240	2,120	3,639	–
Tyringham,	31,990	59	188	1,975	4,310	200	992	22	5 677	–	170	392	181	2
Washington,	39,001	139	241	434	3,810	–	1,917	–	13,050	–	508	397	–	–
West Stockbridge,	46,305	537	2,520	10,050	13,916	–	7,555	419	10,680	–	550	2,406	1,360	–
Williamstown,	71,931	323	431	8,500	20,469	–	17,922	70	13,658	–	1,210	1,338	1,506	51
Windsor,	61,355	805	77	1,566	4,103	–	6,248	28	19,615	–	803	1,495	449	23
Totals,	$1,581,823	12,530	59,285	172,305	340,252	3,625	145,716	3,214	360,731	–	8,602	41,911	27,417	646
Bristol—*Con.*														
Acushnet,	$30,600	222	463	4,997	2,033	–	308	306	4,993	20	636	–	$512	–
Attleborough,	43,106	85	1,473	9,431	2,986	–	115	84	13,131	–	139	47	2,555	–

Berkley,	$15,161	12	720	3,736	150	–	–	4,445	–	–	–	856	–		
Dartmouth,	67,448	25	369	14,228	9,425	–	1,593	27	12,295	–	1,377	–	2,873	–	
Dighton,	17,982	15	801	2,902	1,581	–	172	–	5,751	–	246	–	204	–	
Easton,	24,647	14	484	4,391	1,211	–	70	81	8,248	–	244	–	869	–	
Fairhaven,	18,185	61	228	3,393	1,754	–	170	356	3,914	–	141	–	317	–	
Fall River,	21,176	–	162	4,075	835	–	362	14	4,199	–	609	–	236	–	
Freetown,	11,795	121	569	2,515	–	–	475	–	4,410	–	185	–	710	–	
Mansfield,	17,476	32	278	3,337	1,238	–	20	139	5,120	–	80	3	661	–	
New Bedford,	24,155	10	195	3,380	1,470	–	–	12	3,490	–	75	–	1,850	–	
Norton,	25,873	40	505	4,335	1,312	–	58	56	7,905	–	43	17	672	–	
Pawtucket,	3,475	–	102	580	60	–	–	–	1,025	–	–	–	–	–	
Raynham,	31,043	11	315	5,626	1,279	–	–	–	8,039	–	72	–	1,492	15	
Rehoboth,	30,185	–	989	6,400	2,969	–	480	–	11,008	–	30	75	90	–	
Seekonk,	46,556	–	2,785	10,370	2,999	–	145	19	19,553	–	–	–	345	–	
Somerset,	21,830	19	873	6,391	7,423	–	667	–	8,755	–	985	–	389	–	
Swanzey,	26,561	6	1,732	8,905	6,807	–	884	–	13,245	–	843	–	100	–	
Taunton,	71,012	141	1,684	10,590	1,384	–	–	20	20,037	–	150	12	3,274	450	
Westport,	45,752	47	449	11,510	5,027	–	1,923	31	7,742	–	1,789	8	201	–	
Totals,	$591,921	861	15,176	121,092	51,973	–	7,442	1,148	167,311	20	7,644	162	$17,906	465	

Counties and Towns.	Value of Produce Market Gardens.	Butter, (lbs.)	Cheese, (lbs.)	Hay, (tons.)	Clover Seed, (bushels.)	Grass Seeds, (bushels.)	Hops, (lbs.)	Flax, (lbs.)	Flaxseed, (bush.)	Maple Sugar, (lbs.)	Maple Molasses, (gallons.)	Beeswax, (lbs.)	Honey, (lbs.)	Value of Slaughtered Animals.
Berkshire—*Con.*														
Pittsfield,	$950	51,285	23,559	4,099	–	–	–	–	–	4,500	204	19	150	$17,078
Richmond,	360	32,050	7,110	2,311	–	–	–	–	–	102	76	41	475	8,808
Sandisfield,	250	55,193	246,044	4,441	–	–	–	–	–	123,835	1,810	–	–	13,670
Savoy,	121	36,855	96,661	2,738	–	2	–	–	–	11,805	20	10	31	5,764
Sheffield,	–	119,855	97,134	5,549	149	28	600	–	–	1,457	153	161	2,110	21,582
Stockbridge,	1,897	53,638	15,245	3,550	–	14	5	–	–	50	8	68	1,120	21,610
Tyringham,	2,000	22,600	60,780	1,947	–	–	–	–	–	8,520	205	32	180	4,723
Washington,	–	32,400	19,310	2,696	–	–	–	–	–	3,180	–	30	–	4,328
West Stockbridge,	15	33,450	3,300	2,250	–	6	–	–	–	40	9	87	1,085	16,361
Williamstown,	–	55,778	104,239	3,605	–	5	6	–	–	3,100	201	37	460	11,158
Windsor,	–	68,297	158,385	4,175	–	4	–	–	–	16,217	50	36	490	7,787
Totals,	$12,872	1,336,926	2,103,716	87,955	163	184	25,845	15	2	332,222	5,181	1,234	16,856	$300,615
Bristol—*Con.*														
Acushnet,	$5,577	13,429	575	1,246	–	–	–	–	–	–	–	22	226	$6,910
Attleborough,	1,405	21,197	4,820	2,727	–	14	–	–	–	–	–	–	128	13,499

Berkley,	–	13,820	1,150	674	–	–	–	–	–	–	–	–	–	$5,620
Dartmouth,	$6,080	13,917	865	3,363	–	13	–	–	–	–	–	–	300	16,932
Dighton,	–	6,220	2,320	888	–	15	–	–	–	–	–	–	65	5,951
Easton,	40	10,310	3,180	1,355	–	38	–	–	–	–	–	15	132	7,556
Fairhaven,	2,505	8,276	100	778	–	5	–	–	–	–	–	26	561	5,139
Fall River,	2,180	5,152	160	663	–	6	–	–	–	–	–	–	80	5,000
Freetown,	560	6,625	500	478	–	–	–	–	–	–	–	10	75	3,265
Mansfield,	28	9,265	3,791	866	–	45	–	–	–	–	–	28	215	5,139
New Bedford,	3,515	3,735	–	1,169	–	–	–	–	–	–	–	–	25	14,096
Norton,	175	10,535	6,485	1,128	8	35	–	–	–	–	–	23	110	6,867
Pawtucket,	–	–	–	102	–	–	–	–	–	–	–	–	–	–
Raynham,	160	18,975	3,025	1,317	–	–	–	–	–	–	–	–	65	7,276
Rehoboth,	1,001	10,880	2,250	1,435	–	145	–	–	–	–	–	–	–	8,349
Seekonk,	10,430	3,867	200	2,757	–	–	–	–	–	–	–	–	–	9,926
Somerset,	485	8,135	350	930	–	–	–	–	–	–	–	–	20	12,290
Swanzey,	659	15,279	2,770	1,339	–	105	–	–	–	–	–	32	45	14,662
Taunton,	3,770	33,593	9,450	2,986	–	–	–	–	–	–	–	–	–	60,800
Westport,	1,330	18,291	2,605	2,111	–	15	–	–	–	–	–	26	115	13,667
Totals,	$10,200	234,101	41,596	28,312	8	436	–	–	–	–	–	182	2,162	$223,214

Counties and Towns.	Farms.	Farmers.	Farm Laborers.	Improved land, (acres.)	Unimproved land, (acres.)	Value of Farms.	Value of Farm Implements & Machinery.	Horses.	Asses and Mules.	Milch Cows.	Working Oxen.	Other Cattle.	Sheep.	Swine.
Dukes County.														
Chilmark,	96	108	2	9,597	3,062	$266,890	$5,693	109	–	248	129	103	4,205	139
Edgartown,	85	99	4	6,712	3,206	162,400	4,222	79	–	211	87	182	1,033	113
Tisbury,	85	91	7	5,724	3,201	179,800	5,203	89	–	175	51	223	1,706	121
Totals,	266	298	13	22,033	9,469	$609,090	$15,118	277	–	637	267	808	6,944	373
Essex County.														
Amesbury,	118	135	33	5,358	742	$321,080	$9,865	107	–	311	152	196	171	205
Andover,	166	183	159	7,172	4,719	626,930	18,471	189	–	623	188	249	7	261
Beverly,	92	117	68	4,013	396	318,780	15,018	120	–	381	81	135	13	227
Boxford,	93	101	54	5,943	3,123	321,730	10,510	111	1	411	186	193	189	161
Bradford,	80	80	31	3,105	778	267,900	8,195	92	–	278	84	112	5	142
Danvers,	98	117	59	5,735	753	511,900	20,031	118	–	531	91	109	40	385
Essex,	51	19	91	2,543	943	190,835	7,143	54	–	256	120	31	5	106
Georgetown,	72	73	37	1,608	926	113,200	3,211	66	–	126	50	45	18	65
Gloucester,	19	53	111	3,930	1,031	219,389	7,620	54	–	221	98	65	–	97
Groveland,	64	74	16	2,011	756	151,711	5,171	58	–	162	52	67	38	54

Hamilton,	85	115	39	6,449	959	$299,755	$12,815	112	1	343	143	237	28	222
Haverhill,	208	191	49	8,637	1,769	709,300	16,130	252	–	595	200	326	198	410
Ipswich,	173	187	165	13,565	2,303	526,895	24,840	198	2	616	268	272	79	329
Lawrence,	–	13	2	–	–	–	–	–	–	–	–	–	–	–
Lynn,	35	29	25	520	1,392	149,910	7,535	57	–	114	18	32	101	73
Lynnfield,	39	36	31	1,973	1,099	171,200	6,860	48	–	185	42	63	18	67
Manchester,	26	23	26	878	470	106,300	3,440	22	–	56	38	29	–	72
Marblehead,	59	69	91	1,931	65	271,050	11,734	110	–	186	32	49	22	87
Methuen,	129	137	2	3,695	5,892	450,900	16,652	160	–	603	162	169	1	362
Middleton,	67	78	6	4,277	905	180,550	5,640	67	–	322	70	59	3	135
Nahant,	2	–	7	69	90	27,000	600	8	–	1	10	8	8	–
Newbury,	132	180	91	9,476	1,008	519,910	13,826	160	–	637	256	398	75	166
Newburyport,	57	70	26	2,949	500	216,900	7,530	70	–	290	51	38	1	90
North Andover,	106	103	86	6,503	4,107	544,900	14,600	148	–	483	188	259	100	111
Rockport,	26	26	41	974	329	100,000	3,350	28	–	63	51	20	3	48
Rowley,	120	113	61	5,599	1,031	288,155	7,747	111	–	363	126	161	56	197
Salem,	33	57	92	1,912	12	243,440	11,135	58	–	271	30	68	3	319
Salisbury,	96	126	22	4,919	299	251,850	8,298	85	–	261	190	170	101	154
Saugus,	39	38	20	717	1,864	166,600	5,100	52	–	173	26	35	16	73
South Danvers,	111	151	153	5,021	1,173	689,100	25,010	165	–	453	98	177	97	391
Swampscott,	22	21	46	697	201	171,660	5,110	41	–	61	10	8	–	38

Counties and Towns.	Value of Live Stock.	Wheat, (bush.)	Rye, (bushels.)	Indian Corn, (bushels.)	Oats, (bushels.)	Tobacco, (lbs.)	Wool, (lbs.)	Pease and Beans, (bushels.)	Irish Potatoes. (bushels.)	Sweet Potatoes.	Barley, (bushels.)	Buckwheat, (bushels.)	Value of Orchard Products.	Wine, (gallons.)
Dukes—*Con.*														
Chilmark, . .	$11,849	–	95	3,871	2,133	–	11,406	3	3,714	–	–	10	$120	–
Edgartown, . .	19,958	15	653	3,756	778	–	2,578	21	5,130	–	15	–	38	–
Tisbury, . . .	20,726	10	311	3,207	1,090	–	5,250	2	3,376	2	63	–	222	–
Totals, . . .	$52,533	25	1,059	10,834	4,001	–	19,234	26	12,520	2	78	10	$380	–
Essex—*Con.*														
Amesbury, . .	$26,775	74	394	7,133	1,305	–	90	24	8,512	–	1,783	–	$1,543	–
Andover, . . .	45,636	206	1,156	9,256	3,161	–	34	547	17,675	–	1,200	173	8,621	2
Beverly, . . .	28,503	25	625	5,798	278	–	54	205	6,453	–	1,765	–	2,098	–
Boxford, . . .	32,178	69	229	5,742	3,159	–	528	219	9,815	–	640	16	4,217	100
Bradford, . . .	23,570	15	424	5,163	3,353	–	–	176	5,313	–	319	–	3,265	–
Danvers, . . .	38,954	32	197	7,037	885	1,200	163	243	10,159	–	1,156	2	8,087	50
Essex, . . .	17,665	–	70	3,600	–	–	–	25	2,525	–	1,605	–	2,474	–
Georgetown, . .	12,647	30	116	2,107	355	–	59	110	6,660	–	760	–	2,638	95
Gloucester, . .	17,936	30	121	2,610	60	–	–	157	4,750	–	876	–	1,807	–
Groveland, . .	12,457	25	122	2,956	990	–	150	78	4,917	–	833	–	1,195	12

Hamilton,	$28,049	14	536	4,509	701	–	131	205	8,049	–	759	10	$2,372	2
Haverhill,	57,035	318	1,103	11,992	6,605	–	195	148	18,212	–	863	11	7,552	865
Ipswich,	53,602	17	1,200	9,493	604	–	283	309	12,926	–	1,607	3	5,040	84
Lawrence,	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Lynn,	12,132	–	221	1,507	275	–	–	90	2,635	–	229	25	1,683	–
Lynnfield,	17,960	–	169	2,565	725	–	–	138	2,930	–	–	50	3,320	–
Manchester,	7,245	15	125	1,152	8	–	–	52	2,180	–	438	–	990	–
Marblehead,	20,440	–	73	340	40	–	87	97	10,839	–	161	–	1,983	–
Methuen,	37,906	159	1,081	7,733	5,048	–	–	360	13,368	–	447	24	5,158	–
Middleton,	14,592	–	158	2,050	255	–	–	58	5,570	–	481	–	1,111	–
Nahant,	1,523	–	–	275	200	–	–	300	–	–	–	–	200	–
Newbury,	46,829	111	678	8,141	235	225	188	217	14,459	–	2,889	–	6,572	161
Newburyport,	19,735	80	260	4,065	355	–	–	50	6,980	–	687	–	650	–
North Andover,	41,115	318	339	6,918	4,501	–	225	297	10,110	–	1,095	15	8,954	28
Rockport,	8,685	6	193	587	–	–	–	21	3,730	–	602	–	475	–
Rowley,	25,906	68	419	5,002	318	200	192	198	7,886	–	766	2	2,956	76
Salem,	24,310	–	334	1,215	186	–	8	215	6,215	–	801	–	3,930	–
Salisbury,	27,657	167	480	4,872	651	–	–	139	8,953	–	867	–	1,112	–
Saugus,	12,520	–	365	2,157	–	–	–	61	2,210	–	75	–	546	–
South Danvers,	52,365	87	780	9,550	1,485	–	–	224	15,185	–	747	–	11,580	–
Swampscott,	9,750	–	203	320	–	–	–	258	2,880	–	147	–	262	2

Counties and Towns.	Value of Market Gardens.	Butter, (lbs.)	Cheese, (lbs.)	Hay, (tons.)	Clover Seed, (bushels.)	Grass Seeds, (bushels.)	Hops, (lbs.)	Flax, (lbs.)	Flaxseed, (lbs.)	Maple Sugar, (lbs.)	Maple Molasses, (gallons.)	Beeswax, (lbs.)	Honey, (lbs.)	Value of Slaughtered Animals.
Dukes—*Con.*														
Chilmark,	–	9,694	1,610	1,138	–	–	–	–	–	–	–	–	–	$7,961
Edgartown,	$15	5,632	–	742	–	–	–	–	–	–	–	–	–	4,164
Tisbury,	–	7,550	300	725	–	–	–	–	–	–	–	–	–	5,075
Totals,	$15	22,876	1,910	2,605	–	–	–	–	–	–	–	–	–	$17,200
Essex—*Con.*														
Amesbury,	$15	15,990	3,740	1,423	–	–	–	–	–	–	–	–	–	$6,778
Andover,	7,100	44,135	625	2,779	–	3	–	–	–	–	–	–	20	9,437
Beverly,	7,077	9,375	300	1,439	–	–	–	–	–	–	–	–	20	5,689
Boxford,	250	27,915	2,580	2,077	–	157	–	–	–	–	–	25	185	8,612
Bradford,	2,610	8,375	1,357	1,195	–	–	–	–	–	–	–	3	20	5,050
Danvers,	8,165	16,371	100	2,131	–	–	–	–	–	–	–	–	110	8,669
Essex,	275	12,238	1,825	1,846	–	–	–	–	–	–	–	–	30	5,982
Georgetown,	–	14,995	1,580	1,408	–	–	–	–	–	–	–	–	–	5,576
Gloucester,	5,910	4,055	–	1,460	–	–	–	–	–	–	–	–	50	10,165
Groveland,	75	9,570	4,110	824	–	–	–	–	–	–	–	–	40	4,661

Hamilton,	$250	19,703	1,625	2,290	–	–	–	–	–	–	–	–	66	$18,753
Haverhill,	1,825	26,757	7,625	2,530	–	93	1	–	–	–	–	18	180	10,435
Ipswich,	2,069	30,300	3,935	4,934	–	–	–	–	–	–	–	–	145	16,426
Lawrence,	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Lynn,	9,260	1,695	–	489	–	–	–	–	–	–	–	–	–	2,170
Lynnfield,	6,635	4,575	–	1,282	–	50	–	–	–	–	–	–	–	2,420
Manchester,	3,440	1,528	–	417	–	–	–	–	–	–	–	–	–	2,085
Marblehead,	40,350	450	–	940	–	–	–	–	–	–	–	–	–	2,734
Methuen,	1,654	14,040	1,995	2,393	–	–	–	–	–	–	–	8	95	9,275
Middleton,	514	11,875	250	857	–	–	–	–	–	–	–	20	220	2,999
Nahant,	100	100	–	60	–	–	–	–	–	–	–	–	–	200
Newbury,	3,600	16,838	6,820	4,714	–	–	–	–	–	–	–	–	30	13,762
Newburyport,	4,990	400	–	862	–	–	–	–	–	–	–	–	–	–
North Andover,	1,650	34,225	3,225	2,575	–	1	–	–	–	–	–	10	240	13,080
Rockport,	860	1,180	–	604	–	–	–	–	–	–	–	–	–	2,759
Rowley,	759	18,035	5,055	2,125	–	–	–	–	–	–	–	–	–	7,148
Salem,	12,815	2,180	–	1,114	–	–	–	–	–	–	–	–	–	3,658
Salisbury,	70	10,160	800	1,779	–	–	–	–	–	–	–	–	–	–
Saugus,	3,566	600	50	753	–	–	–	–	–	–	–	–	–	2,115
South Danvers,	35,265	22,097	–	2,152	–	–	–	–	–	–	–	–	–	10,324
Swampscott,	6,530	100	–	479	–	–	–	–	–	–	–	–	10	892

Counties and Towns.	Farms.	Farmers.	Farm Laborers.	Improved land, (acres.)	Unimproved land, (acres.)	Value of Farms.	Value of Farm Implements & Machinery.	Horses.	Asses and Mules.	Milch Cows.	Working Oxen.	Other Cattle.	Sheep.	Swine.
Essex Co.—*Con.*														
Topsfield, . .	83	110	26	6,197	396	$292,975	$10,905	102	–	360	138	107	70	288
Wenham, . .	49	65	19	2,952	486	164,100	6,370	65	–	170	62	97	36	145
West Newbury, .	135	159	75	6,985	759	529,900	15,628	152	–	587	219	280	314	209
Totals, . . .	2,718	3,145	1,893	138,349	41,879	$10,179,105	$316,693	3,273	4	10,532	3,540	4,266	1,816	5,728
Franklin Co.														
Ashfield, . . .	192	222	72	11,711	7,468	$111,558	$12,722	251	–	636	211	846	3,331	309
Bernardston, . .	111	139	55	7,166	5,392	312,750	7,376	160	–	310	146	382	789	208
Buckland, . .	103	135	47	7,565	2,396	226,525	10,390	117	–	405	121	330	1,077	135
Charlemont, . .	128	118	58	9,622	6,863	299,270	7,712	167	–	406	128	601	1,650	153
Colrain, . . .	169	236	124	17,639	7,594	423,805	11,475	282	–	621	326	1,159	1,831	362
Conway, . . .	142	221	54	17,093	2,299	371,800	14,725	186	–	483	212	804	868	205
Deerfield, . .	258	318	167	15,112	4,106	924,605	21,305	331	–	691	285	822	726	678
Erving, . . .	32	39	25	3,131	1,315	73,350	1,665	32	–	101	48	77	76	65
Gill, . . .	88	109	65	6,450	2,127	611,700	7,160	112	–	429	106	412	121	209
Greenfield, . .	104	128	110	9,816	3,070	451,200	17,350	181	–	467	176	630	324	252

Hawley,	108	141	16	8,210	7,830	$159,400	$5,996	144	–	353	112	531	1,759	132
Heath,	118	117	40	8,793	4,491	183,775	5,849	141	–	387	152	603	610	137
Leverett,	71	134	46	7,897	2,197	176,950	9,410	87	–	222	129	324	332	133
Leyden,	121	104	38	6,700	3,815	200,850	5,995	121	–	251	178	435	2,011	137
Monroe,	39	48	9	2,184	1,151	46,375	2,165	46	1	166	52	125	191	40
Montague,	107	180	18	9,086	5,981	371,325	13,163	136	–	307	180	412	349	231
New Salem,	130	216	–	8,543	6,472	218,500	6,825	131	–	335	199	299	290	188
Northfield,	191	418	–	10,535	6,314	549,950	15,533	285	–	528	174	859	1,469	454
Orange,	135	229	–	10,170	5,781	242,750	8,550	172	–	411	184	461	388	224
Rowe,	93	77	19	6,696	5,495	113,785	5,160	113	–	260	114	472	1,483	73
Shelburne,	88	144	58	9,802	2,322	358,700	11,305	145	–	363	155	661	1,406	173
Shutesbury,	72	176	–	4,485	4,869	99,900	3,095	73	–	112	159	161	148	101
Sunderland,	113	123	59	4,853	2,072	328,791	8,647	166	–	308	32	275	114	350
Warwick,	108	238	–	8,598	6,998	155,000	4,955	138	–	320	152	452	401	162
Wendell,	61	109	26	6,765	1,968	89,110	4,570	67	–	111	96	168	83	55
Whately,	134	161	86	10,685	1,939	450,316	10,596	186	–	416	148	503	102	377
Totals,	3,019	4,310	1,192	232,550	112,658	$7,918,073	$236,994	3,979	1	9,465	3,978	12,834	21,871	5,513
HAMPDEN COUNTY.														
Agawam,	160	166	203	9,190	1,719	$186,760	$20,590	239	–	638	198	284	193	268
Blandford,	152	197	84	15,540	11,710	295,025	8,745	193	–	1,161	269	816	830	232

Counties and Towns.	Value of Live Stock.	Wheat, (bush.)	Rye, (bushels.)	Indian Corn, (bushels.)	Oats, (bushels.)	Tobacco, (lbs.)	Wool, (lbs.)	Pease and Beans, (bushels.)	Irish Potatoes, (bushels.)	Sweet Potatoes.	Barley, (bushels.)	Buckwheat, (bushels.	Value of Orchard Products.	Wine, (gallons.)
Essex Co.—*Con.*														
Topsfield,	$28,155	23	210	3,361	683	–	267	127	10,515	–	675	–	$6,918	–
Wenham,	13,886	–	401	2,847	131	–	84	93	4,278	–	421	–	2,224	–
West Newbury,	47,914	126	491	9,724	2,368	–	1,278	274	13,197	318	3,675	–	11,358	217
Totals,	$865,962	2,015	13,276	151,807	39,950	1,625	4,016	5,795	260,114	318	29,375	331	$122,981	1,694
Franklin.—*Con.*														
Ashfield,	$77,029	1,694	367	7,923	2,280	4,187	11,543	–	13,693	–	50	–	$2,385	16
Bernardston,	47,924	518	1,975	6,680	4,387	4,100	2,960	78	6,925	–	311	453	2,086	101
Buckland,	40,103	288	322	5,730	2,346	–	3,903	–	6,103	–	184	54	1,588	–
Charlemont,	51,715	487	1,102	7,847	4,353	–	5,342	64	8,463	–	12	264	2,218	–
Colrain,	97,235	1,672	570	10,164	7,351	512	6,393	277	14,080	–	214	131	3,103	184
Conway,	67,938	1,085	708	10,170	3,631	37,310	3,187	90	7,786	–	120	45	2,226	13
Deerfield,	100,107	2,908	8,351	41,675	16,430	225,971	1,925	199	14,085	–	30	778	4,265	108
Erving,	10,741	44	738	2,800	935	500	226	11	2,515	–	25	85	650	11
Gill,	33,824	802	3,166	9,567	4,501	34,040	387	22	5,725	–	–	202	2,078	–
Greenfield,	56,150	727	3,042	13,920	5,434	37,527	1,016	35	8,295	–	10	343	3,387	–

Hawley,	$37,848	1,244	353	2,753	2,359	–	6,009	54	11,925	–	126	94	$797	–
Heath,	45,148	2,720	50	2,796	1,609	–	1,688	49	12,002	–	228	52	1,115	–
Leverett,	28,468	251	1,719	4,441	2,007	3,700	1,241	51	6,060	–	3	68	1,886	–
Leyden,	40,754	821	252	5,976	4,713	525	7,495	128	5,332	–	111	316	888	18
Monroe,	13,877	301	16	482	697	–	559	9	3,555	–	4	31	631	–
Montague,	26,498	871	5,940	11,360	3,523	38,430	1,236	41	7,841	–	–	400	2,461	24
New Salem,	32,773	538	801	4,506	1,977	1,500	1,016	114	8,817	–	414	609	957	27
Northfield,	71,021	1,790	4,979	21,401	14,203	76,744	3,314	159	11,581	–	60	76	2,628	104
Orange,	37,890	655	1,116	3,861	2,229	–	459	217	9,278	–	481	159	1,065	–
Rowe,	35,498	1,022	111	2,325	1,822	–	4,548	40	10,335	–	–	199	752	–
Shelburne,	58,771	2,337	602	8,730	2,088	40	5,305	19	7,376	–	343	116	3,252	–
Shutesbury,	17,134	96	467	2,013	1,203	–	411	30	6,990	–	11	119	520	–
Sunderland,	34,611	348	3,433	11,340	4,260	76,435	441	–	4,651	–	12	171	2,543	49
Warwick,	29,890	522	862	3,257	2,479	–	1,032	129	7,810	–	297	60	525	8
Wendell,	15,685	164	212	1,627	600	–	283	98	5,538	–	182	136	363	–
Whately,	47,192	724	3,449	11,813	2,783	372,999	317	82	8,274	–	20	384	2,759	41
Totals,	$1,159,157	21,629	44,706	215,757	100,206	914,550	72,566	2,002	215,035	–	3,278	5,345	$47,491	704
HAMPDEN.—*Con.*														
Agawam,	$54,557	137	5,575	13,573	3,138	198,150	374	52	14,562	–	–	2,106	$2,429	849
Blandford,	70,687	279	452	2,961	4,046	–	2,495	28	15,375	–	414	895	562	–

Counties and Towns.	Value of Produce Market Gardens.	Butter, (lbs.)	Cheese, (lbs.)	Hay, (tons.)	Clover Seed, (bushels.)	Grass Seed, (bushels.)	Hops, (lbs.)	Flax, (lbs.)	Flaxseed, (bush.)	Maple Sugar, (lbs.)	Maple Molasses, (gallons.)	Beeswax, (lbs.)	Honey, (lbs.)	Value of Slaughtered Animals.
Essex Co.—*Con.*														
Topsfield, . .	$750	19,532	100	1,764	–	–	–	–	–	–	–	10	110	$6,193
Wenham, . .	1,170	10,365	520	922	–	–	–	–	–	–	–	–	109	4,328
West Newbury, .	1,611	28,250	10,355	3,057	–	2	–	–	–	–	–	10	437	11,528
Totals, . . .	$171,243	438,004	58,572	55,677	–	306	1	–	–	–	–	101	2,147	$251,306
Franklin.—*Con.*														
Ashfield, . . .	$185	67,865	22,821	4,315	–	–	–	–	–	65,136	114	12	136	$9,334
Bernardston, . .	–	32,795	5,550	2,268	–	11	3,050	60	2	8,712	181	28	534	7,161
Buckland, . .	–	40,675	14,395	1,871	–	–	–	–	–	18,167	156	12	60	6,931
Charlemont, . .	–	36,750	18,043	2,520	–	9	–	–	–	17,172	128	45	221	6,618
Colrain, . . .	19	53,715	25,771	4,882	2	14	–	20	–	40,151	674	46	532	12,166
Conway, . . .	126	61,940	17,380	3,199	–	–	–	–	–	39,015	211	–	300	9,036
Deerfield, . .	50	83,951	10,975	5,025	4	5	–	–	–	8,230	32	20	411	18,743
Erving, . . .	–	10,145	2,695	506	–	3	–	–	–	100	20	–	42	2,253
Gill, . . .	725	39,175	1,550	1,856	–	–	150	–	–	814	15	–	325	6,353
Greenfield, . .	–	43,425	2,770	3,090	–	–	300	–	–	3,935	147	48	160	40,686

Hawley,	–	23,968	9,235	1,886	2	9	–	–	–	25,475	201	11	45	$1,796
Heath,	–	41,106	14,511	2,369	–	4	–	–	–	23,097	193	5	5	5,385
Leverett,	–	19,835	7,105	1,468	–	–	–	–	–	16,365	8	–	–	5,215
Leyden,	–	21,807	2,790	2,061	–	6	–	10	–	13,218	205	16	273	5,614
Monroe,	–	9,925	4,132	875	–	–	–	–	–	9,530	44	18	280	1,542
Montague,	–	36,133	6,665	2,118	–	6	–	–	–	9,545	227	88	575	7,327
New Salem,	–	22,091	11,805	1,708	–	6	–	–	–	600	215	–	155	5,187
Northfield,	–	42,185	6,745	3,249	–	6	14,350	–	–	2,300	44	4	707	16,153
Orange,	–	26,857	10,582	1,777	–	–	–	–	–	7,120	330	5	–	7,649
Rowe,	–	24,541	4,090	2,175	–	–	–	–	–	34,115	240	11	50	4,026
Shelburne,	–	48,900	11,755	3,004	–	–	–	–	–	20,820	542	33	190	7,964
Shutesbury,	$5	13,050	4,075	811	–	2	–	–	–	1,225	60	20	–	3,340
Sunderland,	95	36,220	3,410	1,432	–	–	1,600	–	–	11,081	2	–	436	9,899
Warwick,	–	19,125	6,230	1,524	–	1	–	–	–	4,270	1,204	75	–	5,777
Wendell,	–	10,525	2,540	817	–	–	–	–	–	1,720	467	–	50	2,504
Whately,	22	49,931	9,120	2,421	–	–	20	–	–	1,550	137	22	210	10,183
Totals,	$1,227	917,235	229,773	59,557	8	82	19,470	90	2	387,093	5,800	519	5,697	$222,205
HAMPDEN.—*Con.*														
Agawam,	$1,913	51,920	1,075	2,722	–	–	–	–	–	–	–	–	298	$12,406
Blandford,	–	44,560	129,960	3,916	–	3	–	–	–	20,739	182	10	125	8,680

Counties and Towns.	Farms.	Farmers.	Farm Laborers.	Improved land, (acres.)	Unimproved land, (acres.)	Value of Farms.	Value of Farm Implements & Machinery.	Horses.	Asses and Mules.	Milch Cows.	Working Oxen.	Other Cattle.	Sheep.	Swine.
Hampden—*Con.*														
Brimfield, . .	143	176	96	11,938	5,596	$360,150	$11,656	179	–	752	265	631	693	290
Chester, . . .	97	119	144	11,471	4,831	228,200	10,756	141	–	432	196	577	1,094	100
Chicopee, . .	104	130	122	6,196	2,083	405,900	15,371	161	–	393	52	189	31	258
Granville, . .	142	198	146	11,672	8,073	262,565	11,387	187	–	696	244	687	655	185
Holland, . . .	48	65	20	3,681	1,583	76,700	2,995	44	–	149	98	194	286	71
Holyoke, . . .	78	101	47	4,790	2,260	275,900	9,175	130	–	315	72	169	41	161
Longmeadow, . .	120	143	53	7,605	3,665	502,800	19,340	236	–	439	124	432	163	284
Ludlow, . . .	117	158	69	8,427	4,882	370,525	10,580	168	–	441	163	436	435	293
Monson, . . .	170	221	104	11,399	6,031	430,600	13,565	189	–	615	341	755	477	304
Montgomery, . .	43	48	71	4,064	3,036	107,950	4,965	58	–	170	80	211	326	58
Palmer, . . .	139	178	113	10,818	5,018	413,725	10,502	189	–	561	225	556	802	236
Russell, . . .	44	51	30	3,981	3,691	107,993	3,930	56	–	132	76	201	261	45
Southwick, . .	133	199	68	10,081	4,271	320,823	13,883	228	–	400	245	392	564	169
Springfield, . .	103	146	157	7,016	2,037	550,200	18,600	187	–	310	71	164	128	219
Tolland, . . .	64	94	62	8,406	6,814	134,775	5,631	121	–	671	189	425	370	75
Wales, . . .	62	81	20	4,810	1,963	91,150	3,050	57	–	172	112	185	305	66

Westfield, . .	251	331	125	15,116	6,819	$874,920	$32,095	385	–	656	233	795	176	487
West Springfield, .	127	137	101	6,740	2,007	551,100	25,395	181	–	435	98	260	178	319
Willbraham, . .	181	210	82	14,150	5,075	581,900	17,180	264	–	572	242	691	560	256
Totals, . . .	2,481	3,152	1,917	190,301	93,257	$7,429,961	$269,391	3,593	–	10,113	3,596	9,056	8,568	4,376
HAMPSHIRE—*Con.*														
Amherst, . . .	228	143	–	9,476	6,780	$695,125	$23,260	395	–	732	230	693	1,071	396
Belchertown, . .	209	305	225	17,070	7,584	569,245	16,870	323	–	860	432	852	1,451	477
Chesterfield, . .	133	160	62	14,158	3,459	251,680	13,639	170	–	443	136	659	1,464	208
Cummington, . .	118	161	61	11,790	2,774	189,100	10,120	187	–	395	91	575	1,482	171
Easthampton, . .	104	133	104	7,273	1,182	342,615	11,037	146	–	274	84	392	76	229
Enfield, . . .	71	98	77	6,153	1,986	157,650	4,005	88	–	290	108	140	195	124
Groton, . . .	74	90	23	7,992	1,630	115,600	5,450	95	–	268	78	278	580	130
Granby, . . .	107	141	106	9,355	3,368	370,300	10,330	163	–	463	158	444	493	283
Greenwich, . .	67	93	73	6,821	2,081	148,090	4,670	99	–	255	112	215	266	102
Hadley, . . .	240	392	32	10,272	558	814,515	37,705	336	–	549	95	467	580	538
Hatfield, . . .	137	208	30	5,718	876	507,928	18,609	224	–	289	26	252	150	240
Huntington, . .	91	111	60	8,755	2,518	187,150	7,797	103	–	326	116	726	378	139
Middlefield, . .	67	69	61	9,891	3,241	181,005	5,190	103	–	261	64	699	1,704	113
Northampton, . .	240	451	22	12,724	4,040	931,730	38,165	386	–	620	109	516	211	465
Pelham, . . .	95	107	–	4,613	5,046	111,450	5,302	101	–	239	128	213	83	102

Counties and Towns.	Value of Live Stock.	Wheat, (bush.)	Rye, (bushels.)	Indian Corn, (bushels.)	Oats, (bushels.)	Tobacco, (lbs.)	Wool, (lbs.)	Peas and Beans, (bushels.)	Irish Potatoes, (bushels.)	Sweet Potatoes.	Barley, (bushels.)	Buckwheat, (bushels.)	Value of Orchard Products.	Wine, (gallons.)
Hampden—*Con.*														
Brimfield. . .	$66,472	990	1,124	8,192	4,370	6	2,325	311	17,305	–	288	1,501	81,731	147
Chester, . . .	47,799	387	497	3,781	2,412	–	5,250	117	11,231	–	123	586	1,944	12
Chicopee, . .	31,855	161	6,589	11,482	7,142	76,100	–	–	21,900	–	–	1,697	408	–
Granville, . .	57,491	451	1,004	4,356	3,516	1,320	1,892	–	12,636	–	115	860	3,517	–
Holland, . . .	17,005	37	486	2,317	2,318	–	795	107	4,773	–	41	578	316	42
Holyoke, . . .	28,605	261	2,907	7,910	2,020	32,800	–	–	11,185	–	–	853	2,020	–
Longmeadow, . .	55,125	286	1,676	13,113	8,057	111,250	312	98	11,830	–	–	1,130	1,493	10
Ludlow, . . .	50,732	700	6,089	19,825	3,717	2,000	1,018	153	16,333	–	–	1,540	1,250	77
Monson, . . .	74,260	256	2,027	8,855	8,206	–	1,893	302	17,971	–	53	2,268	2,117	123
Montgomery, . .	19,167	34	1,005	1,285	2,478	1,500	1,075	16	3,111	–	20	511	662	–
Palmer, . . .	59,184	355	3,000	10,856	11,239	805	2,053	388	14,118	–	8	1,221	1,581	201
Russell, . . .	15,163	39	503	2,513	726	1,400	568	8	2,522	–	–	92	935	–
Southwick, . .	44,362	88	1,268	6,893	5,295	127,681	1,131	11	11,101	–	80	1,204	2,971	55
Springfield, . .	43,065	205	7,304	13,260	4,359	82,600	316	220	11,985	–	10	1,181	540	–
Tolland, . . .	42,285	121	76	1,275	1,746	–	959	11	6,152	–	12	202	361	–
Wales, . . .	20,515	–	55	1,350	1,785	–	900	87	4,051	–	438	1,352	281	41

Westfield, . .	$83,310	445	13,931	21,645	7,946	361,700	150	20	19,616	12	–	4,528	$2,917	–
West Springfield, .	45,085	440	6,461	12,795	4,109	147,100	–	–	17,670	–	–	1,203	2,158	–
Wilbraham, . .	63,790	502	6,378	12,391	8,755	41,850	1,977	132	17,095	–	–	2,109	2,822	–
Totals, . . .	$993,547	6,280	71,700	180,928	97,380	1,186,262	25,783	2,097	269,128	12	1,632	31,226	$33,078	1,560
HAMPSHIRE—*Con.*														
Amherst, . . .	$86,632	1,846	5,625	21,615	10,107	33,800	3,038	22	11,940	–	–	202	$5,800	–
Belchertown, . .	91,979	733	5,117	15,683	11,538	27,478	4,188	261	21,750	–	9	1,686	2,860	212
Chesterfield, . .	48,724	481	73	5,267	1,656	–	4,555	–	13,547	–	72	539	1,245	–
Cummington, . .	46,168	839	125	3,408	1,924	–	5,162	–	10,575	–	357	686	1,209	–
Easthampton, . .	37,866	293	5,493	12,695	3,358	24,800	293	55	12,263	–	–	310	1,500	22
Enfield, . . .	23,767	101	1,162	4,745	2,607	2,675	672	56	5,893	–	30	516	516	17
Goshen, . . .	21,719	293	52	2,636	1,395	–	2,031	–	8,915	–	100	290	701	–
Granby, . . .	49,363	234	6,072	10,113	2,069	21,200	2,572	25	12,555	–	–	1,310	2,316	54
Greenwich, . .	21,741	329	1,801	4,735	2,887	–	781	98	5,820	–	15	775	438	11
Hadley, . . .	72,032	806	8,666	35,505	5,317	260,250	2,122	–	11,673	–	–	–	3,891	–
Hatfield, . . .	19,339	296	2,562	21,110	1,792	516,851	400	–	6,250	–	–	25	1,612	–
Huntington, . .	39,271	246	703	5,262	1,197	–	1,308	–	7,343	–	–	110	2,621	–
Middlefield, . .	45,777	259	–	2,186	1,367	–	6,970	–	8,120	–	302	141	1,210	–
Northampton, . .	85,712	750	6,208	32,760	3,736	158,100	740	10	24,673	–	25	70	6,221	–
Pelham, . . .	21,383	777	631	1,935	1,374	–	135	–	9,575	–	–	–	1,285	–

Counties and Towns.	Value of Produce Market Gardens.	Butter, (lbs.)	Cheese, (lbs.)	Hay, (tons.)	Clover Seed, (bushels.)	Grass Seeds, (bushels.)	Hops, (lbs.)	Flax, (lbs.)	Flaxseed, (bush.)	Maple Sugar, (lbs.)	Maple Molasses, (gallons.)	Beeswax, (lbs.)	Honey, (lbs.)	Value of Slaughtered Animals.
Hampden—*Con.*														
Brimfield, . .	$410	40,104	47,135	3,305	14	15	34	–	–	–	117	39	719	$19,231
Chester, . . .	–	35,150	12,600	2,693	–	1	–	–	–	21,470	99	2	85	6,369
Chicopee, . . .	8,110	59,230	–	1,693	–	–	–	–	–	–	–	–	–	6,123
Granville, . .	200	39,205	49,950	2,724	–	–	–	60	3	13,275	167	–	103	9,919
Holland, . . .	25	6,726	4,929	975	2	19	34	10	–	15	11	22	495	3,793
Holyoke, . . .	1,250	45,950	1,356	–	–	–	–	–	–	–	–	–	–	5,635
Longmeadow, . .	360	48,275	2,355	2,613	–	1	–	–	–	–	–	–	–	11,077
Ludlow, . . .	474	32,932	9,115	2,081	–	–	–	–	–	–	–	35	1,079	11,112
Monson, . . .	2,135	42,744	21,047	3,926	47	73	15	–	–	7	11	48	1,211	19,125
Montgomery, . .	–	16,150	–	965	9	–	–	–	–	–	–	4	175	3,101
Palmer, . . .	688	30,642	20,020	2,995	9	388	50	–	–	–	12	36	900	11,666
Russell, . . .	–	9,775	2,730	816	–	–	–	–	–	110	–	1	133	2,246
Southwick, . .	–	31,350	2,085	2,172	–	3	–	–	–	–	–	46	1,419	8,711
Springfield, . .	6,384	20,665	200	1,133	–	90	–	–	–	–	–	–	60	8,813
Tolland, . . .	–	20,125	102,900	2,257	–	–	–	–	–	37,782	611	–	–	4,184
Wales, . . .	84	9,132	5,805	1,015	–	7	36	–	–	22	29	42	70	4,075

Westfield, . .	$50	71,908	1,400	3,586	–	–	–	–	–	–	–	–	1,450	$16,320
West Springfield, .	8,473	64,950	–	2,292	–	–	–	–	–	–	–	–	110	7,385
Wilbraham, . .	198	42,585	11,630	3,173	28	80	–	–	–	20	50	–	805	11,219
Totals, . . .	$30,781	767,378	429,592	47,382	89	680	169	70	3	93,470	1,319	288	9,240	$197,493
HAMPSHIRE—*Con.*														
Amherst, . . .	–	72,290	36,080	4,005	–	2	–	–	–	350	–	–	–	$9,122
Belchertown, . .	$75	82,654	40,762	4,386	77	66	–	–	–	75	30	98	885	18,685
Chesterfield, . .	–	57,339	9,350	2,677	–	–	–	–	–	48,590	–	–	–	7,305
Cummington, . .	–	51,980	12,755	2,176	–	–	–	–	–	27,290	–	–	100	4,375
Easthampton, . .	300	36,975	200	1,451	–	–	–	–	–	–	–	10	30	9,621
Enfield, . . .	–	20,850	25,075	1,280	21	38	–	–	–	–	4	–	20	4,919
Goshen, . . .	–	32,300	7,600	1,476	–	–	–	–	–	14,850	–	–	–	3,153
Granby, . . .	–	56,710	4,116	2,256	1	8	30	–	–	60	60	13	877	11,649
Greenwich, . .	–	17,640	24,330	1,203	1	12	–	–	–	–	1	–	–	4,421
Hadley, . . .	–	97,110	–	3,841	–	–	–	–	–	–	–	–	–	12,885
Hatfield, . . .	10	48,518	–	2,619	–	–	–	–	–	–	–	–	–	8,613
Huntington, . .	–	39,900	6,250	1,930	–	–	–	–	–	13,438	–	–	–	5,170
Middlefield, . .	–	33,025	5,975	2,116	–	–	–	–	–	18,650	–	–	–	4,415
Northampton, . .	2,100	102,758	400	4,762	–	–	–	–	–	–	–	–	–	11,735
Pelham, . . .	–	25,100	6,475	1,186	–	–	–	–	–	–	–	–	–	4,067

Counties and Towns.	Farms.	Farmers.	Farm Laborers.	Improved land, (acres.)	Unimproved land, (acres.)	Value of Farms.	Value of Farm Implements & Machinery.	Horses.	Asses and Mules.	Milch Cows.	Working Oxen.	Other Cattle.	Sheep.	Swine.
Hampshire—*Con.*														
Plainfield, . .	95	143	46	9,041	1,883	$137,350	$6,910	143	–	319	88	380	931	112
Prescott, . . .	66	84	–	3,799	2,148	123,300	2,883	79	–	268	96	170	87	83
South Hadley, . .	114	156	42	6,862	785	426,800	22,312	173	–	456	99	305	288	266
Southampton, . .	155	179	86	12,557	2,622	369,200	17,510	218	–	436	118	610	685	317
Ware, . . .	103	166	191	10,635	2,601	311,500	8,176	111	–	558	191	442	277	199
Westhampton, . .	91	117	24	9,859	3,177	198,800	13,775	122	–	315	69	470	667	151
Williamsburg, . .	129	158	6	13,770	2,961	311,450	9,895	163	–	406	132	610	1,165	168
Worthington, . .	142	157	88	15,502	3,882	282,090	8,201	159	1	567	162	762	1,662	211
Totals, . . .	2,876	3,828	1,421	311,119	67,218	$7,736,673	$302,111	4,117	1	9,589	2,955	10,960	15,946	5,257
Middlesex Co.														
Acton, . . .	205	216	19	7,745	5,506	$636,050	$25,560	225	–	738	118	507	3	313
Ashby, . . .	184	173	55	10,147	5,317	382,610	18,891	218	–	600	177	474	186	353
Ashland, . . .	78	71	15	3,718	1,651	263,900	7,745	110	–	271	40	131	1	160
Bedford, . . .	89	91	10	4,310	2,127	328,725	18,010	127	–	338	38	238	11	191
Belmont, . . .	82	98	–	2,093	1,017	893,100	41,995	216	2	217	26	51	–	328

Billerica,	143	152	113	6,992	4,104	$525,200	$19,866	195	1	529	98	245	6	210
Boxborough,	62	69	5	3,004	1,497	178,625	8,645	79	–	389	46	94	5	124
Brighton,	56	54	75	1,337	16	601,100	8,430	128	–	106	6	–	–	176
Burlington,	54	70	81	2,992	1,378	245,956	9,075	103	–	236	48	69	6	141
Cambridge,	19	18	23	419	30	225,000	4,150	31	–	38	2	–	–	29
Carlisle,	126	131	15	4,522	3,707	299,750	13,705	89	–	356	102	200	6	190
Charlestown,	–	1	–	–	–	–	–	–	–	–	–	–	–	–
Chelmsford,	133	128	126	6,121	3,931	495,800	22,875	184	–	530	76	308	37	226
Concord,	217	270	48	11,364	7,033	917,350	42,450	275	–	1,104	126	677	15	318
Dracut,	131	169	163	7,661	3,327	547,850	20,405	172	–	795	187	290	55	307
Dunstable,	91	87	37	5,686	3,113	281,160	11,590	100	–	403	114	352	87	221
Framingham,	191	308	136	8,829	3,440	972,900	33,385	246	4	873	117	200	6	574
Groton,	240	249	123	12,060	6,483	846,600	44,170	325	–	910	251	437	157	445
Holliston,	121	132	20	5,802	1,553	400,300	10,945	126	–	392	98	198	11	289
Hopkinton,	130	143	37	7,301	3,038	384,900	12,680	192	–	483	84	205	3	309
Lexington,	148	110	211	6,938	2,093	810,350	37,175	270	–	903	52	517	2	397
Lincoln,	47	139	36	2,337	1,967	246,450	10,570	67	–	200	30	92	–	78
Littleton,	151	154	13	7,072	3,299	463,787	24,935	205	–	785	114	380	16	300
Lowell,	7	47	20	248	229	109,600	1,950	20	–	62	10	19	–	40
Malden,	23	74	56	736	253	309,200	4,645	34	–	56	–	12	–	31
Marlborough,	202	300	151	10,751	3,978	781,125	30,297	248	3	977	237	308	13	656

Counties and Towns.	Value of Live Stock.	Wheat, (bush.)	Rye, (bushels.)	Indian Corn, (bushels.)	Oats, (bushels.)	Tobacco, (lbs.)	Wool, (lbs.)	Pease and Beans, (bushels.)	Irish Potatoes, (bushels.)	Sweet Potatoes.	Barley, (bushels.)	Buckwheat, (bushels.)	Value of Orchard Products.	Wine, (gallons.)
Hampshire—*Con.*														
Plainfield,	$35,178	758	1,013	2,595	996	–	3,385	8	10,506	–	315	192	$570	–
Prescott,	21,083	460	72	3,180	1,935	–	–	–	5,810	–	115	323	820	–
South Hadley,	51,315	492	3,940	15,432	1,725	53,500	886	–	9,093	–	–	–	2,700	–
Southampton,	51,997	109	5,210	11,780	3,037	9,020	2,227	6	16,015	–	25	1,217	2,697	–
Ware,	44,465	584	1,926	9,305	5,620	–	858	169	10,618	–	–	829	973	64
Westhampton,	44,915	39	819	4,485	1,399	400	2,311	37	7,840	–	60	213	3,205	–
Williamsburg,	48,539	82	237	6,550	802	25,315	4,210	–	7,208	–	20	25	2,720	–
Worthington,	58,553	1,291	–	5,722	2,825	–	6,399	–	16,070	–	438	1,064	1,354	–
Totals,	$1,082,578	12,091	57,600	245,304	70,993	$1,113,689	55,273	747	267,052	–	1,913	10,586	$18,203	380
Middlesex—*Con.*														
Acton,	$57,555	288	1,567	10,898	5,261	–	–	430	15,497	–	737	94	$15,007	54
Ashby,	51,015	2,692	518	7,476	3,535	–	556	422	13,086	–	765	20	6,284	43
Ashland,	25,220	40	413	4,062	2,696	–	–	65	7,099	–	98	25	2,203	162
Bedford,	29,051	11	204	4,385	946	–	–	94	15,060	–	168	46	4,960	12
Belmont,	59,807	–	1,012	2,231	115	–	–	–	5,765	–	–	–	19,181	1,500

Billerica, . . .	$14,394	105	1,138	8,869	985	–	25	436	15,457	–	661	133	87,107	44
Boxborough, . .	22,480	172	209	3,619	1,674	–	–	131	5,795	–	224	–	7,040	6
Brighton, . . .	19,435	–	561	1,115	–	–	–	–	6,168	–	–	–	5,916	–
Burlington, . .	20,650	60	509	4,055	200	–	24	112	3,796	–	4	2	2,165	–
Cambridge, . .	6,620	–	90	885	–	–	–	–	1,730	–	–	–	6,050	–
Carlisle, . . .	26,985	20	768	5,427	1,500	–	–	217	9,219	–	170	139	5,152	–
Charlestown, . .	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Chelmsford, . .	41,431	160	1,236	9,460	2,501	–	146	368	11,170	–	457	117	7,565	20
Concord, . . .	90,705	457	1,624	15,811	6,060	–	–	560	31,582	–	878	110	13,810	197
Dracut, . . .	53,298	269	1,251	10,210	5,032	–	173	381	16,911	–	236	430	7,838	53
Dunstable, . .	31,701	340	1,190	4,695	2,895	–	313	224	8,529	–	20	260	2,373	61
Framingham, . .	69,105	373	1,515	17,690	8,532	–	50	–	25,210	–	335	221	10,192	–
Groton, . . .	63,015	295	2,040	16,197	7,113	10	478	765	21,689	–	651	141	11,781	38
Holliston, . . .	30,638	157	407	6,793	3,631	–	37	205	11,759	–	300	96	4,563	119
Hopkinton, . .	42,620	370	223	6,180	3,726	–	4	129	14,276	–	262	142	2,263	468
Lexington, . .	82,565	–	850	13,015	745	–	–	–	18,650	–	370	–	14,665	–
Lincoln, . . .	20,125	40	352	3,510	382	–	–	80	4,210	–	360	22	2,560	2
Littleton, . . .	56,381	316	817	10,616	3,526	–	–	176	10,787	–	516	81	11,690	4
Lowell, . . .	5,000	–	150	1,325	560	–	–	132	1,960	–	30	–	800	–
Malden, . . .	6,030	–	146	585	30	–	–	781	1,160	–	–	–	463	–
Marlborough, . .	69,092	357	851	12,636	4,184	–	49	–	24,407	–	1,729	75	17,838	–

Counties and Towns.	Value of Produce Market Gardens.	Butter, (lbs.)	Cheese, (lbs.)	Hay, (tons.)	Clover Seed, (bushels.)	Grass Seeds, (bushels.)	Hops, (lbs.)	Flax, (lbs.)	Flaxseed, (bush.)	Maple Sugar, (lbs.)	Maple Molasses, (gallons.)	Beeswax, (lbs.)	Honey, (lbs.)	Value of Slaughtered Animals.
Hampshire—*Con.*														
Plainfield,	–	37,710	11,650	1,980	–	–	–	–	–	30,035	–	–	–	$3,651
Prescott,	–	12,725	60,650	1,117	–	–	–	–	–	–	40	–	60	3,272
South Hadley,	$800	78,660	600	2,474	–	–	–	–	–	–	–	–	–	7,506
Southampton,	–	60,468	1,600	2,299	–	–	–	–	–	–	–	6	250	8,119
Ware,	–	30,800	53,980	2,885	–	24	–	–	–	–	4	–	15	7,180
Westhampton,	–	37,225	2,460	1,316	–	–	–	–	–	5,270	1,331	16	262	7,360
Williamsburg,	–	59,458	7,155	1,967	–	–	–	–	–	5,225	–	–	–	6,255
Worthington,	–	69,575	6,700	3,721	–	–	–	–	–	33,250	30	–	–	5,933
Totals,	$3,285	1,161,770	324,493	55,126	100	150	30	–	–	197,083	1,500	113	2,199	$169,741
Middlesex—*Con.*														
Acton,	$19,495	23,788	–	3,291	2	429	22	–	–	–	–	–	115	$19,981
Ashby,	613	55,220	1,755	2,744	1	22	–	–	–	–	–	–	200	12,683
Ashland,	1,225	23,420	925	1,133	–	–	–	–	–	–	–	15	142	6,850
Bedford,	15,745	6,935	–	2,022	–	–	–	–	–	–	–	–	40	11,986
Belmont,	90,965	250	–	1,733	–	–	–	–	–	–	–	–	–	7,407

Billerica, . .	$6,242	20,975	175	2,437	–	–	–	–	–	–	–	19	60	$6,200
Boxborough, . .	12,665	10,600	–	1,518	–	1,012	742	–	–	–	–	–	120	5,840
Brighton, . . .	43,805	–	–	796	–	–	–	–	–	–	–	–	–	3,762
Burlington, . .	8,235	2,130	–	1,241	–	–	300	–	–	–	–	–	–	3,669
Cambridge, . .	11,950	–	–	270	–	–	–	–	–	–	–	–	–	350
Carlisle, . . .	5,090	19,170	–	1,754	–	–	–	–	–	–	–	–	130	4,612
Charlestown, . .	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Chelmsford, . .	4,221	13,064	230	2,596	–	–	–	–	–	–	–	7	76	14,015
Concord, . . .	63,240	13,570	–	5,201	–	40	–	–	–	–	–	–	458	14,423
Dracut, . . .	6,084	9,857	985	3,062	1	–	–	–	–	–	–	–	40	10,767
Dunstable, .	6	21,450	6,235	1,706	–	8	–	–	–	–	–	–	–	7,755
Framingham, . .	2,055	43,900	1,100	3,553	–	–	–	–	–	–	–	10	170	17,450
Groton, . . .	613	54,350	1,800	5,016	–	–	4,500	–	–	–	–	–	12	27,639
Holliston, . . .	1,773	30,630	3,010	1,543	–	4	–	–	–	–	–	20	146	9,539
Hopkinton, . .	2,762	40,380	9,525	1,773	–	–	7	–	–	–	–	10	50	12,300
Lexington, . .	26,895	1,400	–	3,722	–	–	–	–	–	–	–	–	–	6,903
Lincoln, . . .	11,900	3,900	–	1,197	–	107	10	–	–	–	–	–	80	1,570
Littleton, . . .	28,860	21,800	99	3,156	–	13	50	–	–	–	–	–	459	10,194
Lowell, . . .	1,700	150	–	310	–	–	–	–	–	–	–	–	20	1,430
Malden, . . .	62,760	–	–	485	–	–	–	–	–	–	–	–	–	–
Marlborough, . .	315	53,741	500	4,065	–	–	–	–	–	–	–	–	33	16,781

Counties and Towns.	Farms.	Farmers.	Farm Laborers.	Improved land, (acres.)	Unimproved land, (acres.)	Value of Farms.	Value of Farm Implements & Machinery.	Horses.	Asses and Mules.	Milch Cows.	Working Oxen.	Other Cattle.	Sheep.	Swine.
Middlesex—*Con.*														
Medford,	17	41	64	849	499	$410,000	$5,215	31	–	55	18	10	–	27
Melrose,	16	34	19	306	411	89,700	2,420	15	–	51	10	21	–	59
Natick,	117	128	33	4,891	1,310	475,600	11,860	205	–	369	61	153	–	239
Newton,	148	187	145	4,662	1,388	1,550,500	25,533	282	–	428	70	48	–	373
North Reading,	52	83	41	1,751	3,628	216,200	7,240	53	–	203	70	67	8	119
Pepperell,	224	173	75	9,061	3,388	485,250	22,380	211	–	663	176	485	88	475
Reading,	42	90	31	1,326	1,027	199,950	5,695	51	–	183	20	31	2	87
Sherborn,	131	131	71	6,928	2,227	556,700	14,045	117	–	505	112	275	3	261
Shirley,	113	87	61	5,594	5,216	353,600	9,995	181	–	424	90	323	49	136
Somerville,	18	46	33	458	58	581,000	3,125	28	–	46	4	1	–	46
South Reading,	25	53	32	699	491	139,100	4,240	41	–	95	4	11	–	67
Stoneham,	29	37	23	692	752	161,800	2,815	33	–	111	4	17	–	37
Stow,	169	188	13	6,991	4,511	480,295	24,160	201	–	519	110	186	6	311
Sudbury,	157	247	91	9,082	4,867	563,145	22,355	199	–	616	159	93	19	371
Tewksbury,	108	125	138	5,861	3,032	517,200	21,178	170	–	482	110	156	33	453
Townsend,	212	189	73	7,858	6,982	385,315	18,610	218	–	461	161	335	81	355

Tyngsborough, .	60	58	61	3,931	4,061	$194,400	$7,375	83	–	257	86	239	86	144
Waltham, . .	116	72	165	4,117	1,876	872,800	35,175	238	–	621	46	118	6	366
Watertown, . .	63	42	14	1,621	67	735,500	12,616	117	–	132	8	24	3	135
Wayland, . .	100	117	59	5,005	2,108	374,300	13,510	140	–	416	64	276	4	207
West Cambridge, .	98	58	227	2,016	165	638,800	28,850	216	–	203	10	38	–	208
Westford, . .	174	111	101	7,751	5,953	532,900	18,980	192	–	663	175	301	37	226
Weston, . . .	116	186	92	5,226	4,198	531,250	18,790	167	1	466	67	133	4	220
Wilmington, . .	50	73	40	3,125	1,808	197,700	6,650	59	–	186	46	49	2	108
Winchester, . .	58	48	93	2,310	506	408,500	17,650	108	–	111	30	17	–	113
Woburn, . . .	51	100	58	1,571	1,401	292,400	9,420	82	–	180	38	48	–	163
Totals, . . .	5,400	6,257	3,453	244,207	132,083	$24,127,893	$854,586	7,495	11	20,806	3,979	9,465	1,060	11,745
NANTUCKET CO.														
Nantucket, . .	130	120	53	6,736	6,381	$166,518	$12,008	180	–	540	36	258	1,077	292
NORFOLK CO.														
Bellingham, . .	133	121	27	4,762	3,746	$312,000	$7,872	125	–	318	106	81	11	222
Braintree, . .	91	121	28	2,616	2,131	451,300	10,747	130	–	281	44	62	16	165
Brookline, . .	47	67	89	1,102	835	1,365,500	20,900	118	–	162	64	67	4	116
Canton, . . .	71	83	47	1,369	3,076	214,200	4,363	111	1	212	40	89	–	133
Cohasset, . . .	67	72	39	2,011	949	210,960	5,110	59	–	165	56	95	111	125

Counties and Towns.	Value of Live Stock.	Wheat, (bush.)	Rye, (bushels.)	Indian Corn, (bushels.)	Oats, (bushels.)	Tobacco, (lbs.)	Wool, (lbs.)	Pease and Beans, (bushels.)	Irish Potatoes, (bushels.)	Sweet Potatoes.	Barley, (bushels.)	Buckwheat, (bushels.)	Value of Orchard Products.	Wine, (gallons.)
Middlesex—*Con.*														
Medford, . . .	$9,665	–	265	1,555	–	–	–	279	1,010	–	106	–	$2,205	–
Melrose, . . .	4,825	8	135	663	–	–	–	69	1,175	–	19	–	165	–
Natick, . . .	38,383	47	728	6,243	2,697	–	–	160	12,580	–	551	281	4,095	109
Newton, . . .	56,729	111	2,805	8,026	225	–	–	111	15,480	–	197	–	18,206	–
North Reading, .	14,596	–	253	3,291	195	–	–	282	3,875	–	459	25	707	18
Pepperell, . .	56,393	530	1,125	11,326	8,319	–	300	780	14,533	–	298	198	5,887	31
Reading, . . .	11,536	–	100	1,909	123	–	–	98	1,797	–	219	68	992	–
Sherborn, . .	41,315	273	783	6,338	2,906	–	–	104	9,993	–	917	22	11,267	217
Shirley, . . .	33,740	595	953	6,177	1,305	–	200	514	9,260	–	114	423	3,790	192
Somerville, . .	5,645	6	356	175	–	–	–	115	2,320	–	–	–	3,065	–
So h Reading, .	8,565	8	66	1,232	65	–	–	122	1,780	–	58	–	755	40
Stoneham, . .	6,730	10	158	965	–	–	–	67	1,741	–	45	–	778	10
Stow, . . .	45,596	77	1,003	9,007	4,195	–	–	296	11,690	–	655	113	7,925	38
Sudbury, . . .	46,383	95	2,212	12,069	7,179	–	49	27	27,037	–	152	53	6,966	–
Tewksbury, . .	39,969	20	2,509	7,860	2,781	–	83	400	17,930	–	273	38	2,867	36
Townsend, . .	43,467	751	1,352	9,689	2,432	–	274	575	13,319	–	93	330	4,900	446

Tyngsborough,	$22,581	260	768	3,652	1,929	–	273	117	7,726	–	161	83	$2,066	–
Waltham,	62,510	–	1,112	10,890	–	–	–	38	14,771	–	609	–	11,070	300
Watertown,	23,120	–	875	1,765	40	–	–	33	3,661	–	–	–	6,205	–
Wayland,	33,869	117	1,929	8,102	1,155	–	–	10	16,362	–	704	46	3,225	–
West Cambridge,	39,960	–	115	4,117	–	–	–	–	7,807	–	–	–	12,650	–
Westford,	41,846	233	885	9,690	4,160	–	85	428	14,654	–	796	51	11,297	55
Weston,	35,157	18	758	7,600	760	–	28	20	11,110	–	1,261	33	4,003	20
Wilmington,	11,150	45	351	2,720	289	–	8	128	6,725	–	207	–	910	–
Winchester,	23,375	15	520	3,385	–	–	–	–	6,310	–	75	–	5,780	–
Woburn,	15,885	25	242	3,058	31	–	–	299	5,424	–	45	–	1,503	6
Totals,	$1,807,871	9,796	42,032	324,272	106,654	10	3,155	10,846	554,408	–	17,018	3,947	$326,075	4,334
NANTUCKET—*Con.*														
Nantucket,	$31,468	149	182	8,709	945	–	2,957	129	5,079	50	810	–	$30	–
NORFOLK—*Con.*														
Bellingham,	$21,549	21	941	4,256	2,275	–	40	126	10,777	–	319	102	$1,754	–
Braintree,	24,820	–	146	2,665	–	–	60	79	5,195	–	393	–	2,910	30
Brookline,	36,100	–	1,315	595	80	–	–	942	8,330	–	50	–	12,785	–
Canton,	20,115	–	–	2,342	–	–	–	–	2,875	–	419	–	–	–
Cohasset,	16,805	3	305	1,797	90	–	413	8	2,679	–	360	–	666	–

Counties and Towns.	Value of Produce Market Gardens.	Butter, (lbs.)	Cheese, (lbs.)	Hay, (tons.)	Clover Seed, (bushels.)	Grass Seeds, (bushels.)	Hops, (lbs.)	Flax, (lbs.)	Flaxseed, (bush.)	Maple Sugar, (lbs.)	Maple Molasses, (gallons.)	Beeswax, (lbs.)	Honey, (lbs.)	Value of Slaughtered Animals.
Middlesex—*Con.*														
Medford,	$2,670	–	–	688	–	–	–	–	–	–	–	–	–	$50,320
Melrose,	555	115	–	308	–	–	–	–	–	–	–	–	–	–
Natick,	1,745	27,779	850	1,784	–	–	–	–	–	–	–	20	40	13,816
Newton,	68,640	900	–	2,349	–	–	–	–	–	–	–	–	–	9,128
North Reading,	874	11,804	75	928	–	–	–	–	–	–	–	–	–	2,650
Pepperell,	57	52,069	5,720	2,912	11	43	–	–	–	–	–	25	211	15,618
Reading,	2,035	6,674	100	591	–	–	–	–	–	–	–	–	1,000	8,813
Sherborn,	487	37,585	3,015	2,489	–	12	5	–	–	–	–	11	105	20,097
Shirley,	2,518	20,125	6,995	1,933	4	28	27,050	–	–	–	160	9	288	14,024
Somerville,	6,520	–	–	372	–	–	–	–	–	–	–	–	–	695
South Reading,	550	3,075	–	306	–	–	–	–	–	–	–	–	–	28,945
Stoneham,	605	2,040	150	475	–	–	–	–	–	–	–	–	–	1,127
Stow,	12,702	22,990	–	2,623	–	87	–	–	–	–	–	–	230	7,799
Sudbury,	328	27,445	4,795	2,910	–	39	–	–	–	–	–	–	6	13,531
Tewksbury,	13,460	14,142	100	1,866	–	–	–	–	–	–	–	–	87	6,066
Townsend,	445	35,195	3,130	2,061	1	2	–	–	–	–	–	–	62	13,550

Tyngsborough,	$100	11,646	1,165	1,404	–	–	–	–	–	–	–	3	70	$3,672
Waltham,	24,570	2,205	–	2,495	–	–	–	–	–	–	–	–	–	7,097
Watertown,	25,810	–	–	1,120	–	–	–	–	–	–	–	–	–	2,732
Wayland,	210	6,650	420	1,821	–	–	–	–	–	–	–	–	–	8,822
West Cambridge,	116,655	–	–	812	–	–	–	–	–	–	–	–	–	4,290
Westford,	881	28,700	2,610	2,629	–	–	1,000	–	–	–	–	30	231	19,759
Weston,	9,403	8,575	350	2,333	–	–	–	–	–	–	–	–	–	9,093
Wilmington,	685	11,665	–	902	–	–	4,700	–	–	–	–	–	100	2,610
Winchester,	41,190	–	–	741	–	–	–	–	–	–	–	–	–	2,175
Woburn,	10,935	3,680	–	873	–	–	–	–	–	–	–	–	–	3,833
Totals,	$774,234	806,039	55,811	96,118	20	1,846	38,386	–	–	–	160	179	4,781	$504,431
NANTUCKET—*Con.*														
Nantucket,	$5,183	23,767	–	2,440	–	–	–	–	–	–	–	–	–	$5,674
NORFOLK—*Con.*														
Bellingham,	$20	18,005	650	1,351	–	–	–	–	–	–	–	–	–	$5,422
Braintree,	5,306	5,787	30	1,501	–	–	–	–	–	–	–	300	50	6,052
Brookline,	62,925	5,065	100	1,557	–	–	–	–	–	–	–	–	–	26
Canton,	–	6,030	–	801	–	–	–	–	–	–	–	–	–	10,239
Cohasset,	478	8,910	2,140	866	–	–	–	–	–	–	–	15	120	4,043

Counties and Towns.	Farms.	Farmers.	Farm Laborers.	Improved land, (acres.)	Unimproved land, (acres.)	Value of Farms.	Value of Farm Implements & Machinery.	Horses.	Asses and Mules.	Milch Cows.	Working Oxen.	Other Cattle.	Sheep.	Swine.
NORFOLK—*Con.*														
Dedham,	160	198	120	2,473	7,569	$177,850	$17,665	251	2	774	97	65	8	702
Dorchester,	183	121	122	2,651	456	2,978,650	26,196	312	—	315	28	88	—	466
Dover,	66	73	9	2,869	1,863	208,000	5,920	89	—	252	45	109	—	145
Foxborough,	125	123	39	4,119	4,534	362,850	7,761	133	1	288	71	78	—	181
Franklin,	167	165	36	6,991	5,901	423,150	11,821	181	—	492	152	169	—	300
Medfield,	73	109	12	4,021	2,171	211,500	7,365	91	—	266	85	119	—	178
Medway,	131	203	32	7,087	3,535	471,800	11,720	178	—	521	126	211	11	356
Milton,	137	131	2	4,310	1,851	1,130,150	21,748	231	5	489	60	125	—	908
Needham,	109	169	10	4,021	3,700	625,000	13,015	209	—	397	31	130	8	337
Quincy,	106	160	71	3,906	959	770,050	19,509	227	—	586	21	138	—	687
Randolph,	93	112	17	2,950	4,121	473,220	9,860	110	—	185	31	37	2	237
Roxbury,	26	27	25	562	31	1,113,500	7,290	51	—	41	10	6	—	50
Sharon,	130	133	8	1,918	6,648	287,600	8,361	126	—	335	66	111	—	208
Stoughton,	70	131	8	1,215	3,510	178,650	4,087	69	—	191	36	22	—	94
Walpole,	155	117	57	5,679	4,101	452,600	10,211	200	—	426	93	183	1	286
Weymouth,	101	127	33	2,371	1,685	318,735	7,690	123	2	211	12	45	1	183

West Roxbury, .	102	125	31	2,162	1,522	$1,602,925	$19,095	191	–	312	41	13	–	377
Wrentham, . .	278	240	108	10,166	11,458	739,813	16,116	283	–	767	198	333	83	416
Totals, . . .	2,630	2,868	978	72,057	86,364	$15,476,642	$277,485	3,610	11	8,019	1,525	2,115	259	6,902
PLYMOUTH CO.														
Abington, . .	164	106	5	3,881	4,859	$804,201	$9,875	211	–	367	54	99	27	242
Bridgewater, . .	160	151	84	5,788	4,670	449,855	13,169	175	–	415	122	113	33	376
Carver, . . .	63	87	61	2,309	6,851	124,500	4,610	61	–	153	48	110	131	110
Duxbury, . .	121	103	63	3,691	2,428	239,530	5,336	122	–	230	48	110	12	147
East Bridgewater, .	126	137	59	3,862	3,930	369,325	9,060	133	–	274	101	126	–	180
Halifax, . . .	81	81	17	2,731	3,516	199,394	3,350	72	–	186	86	106	51	116
Hanover, . . .	99	96	32	3,671	3,266	289,100	5,577	106	–	205	78	106	91	132
Hanson, . . .	97	62	28	2,155	3,519	215,115	3,825	98	–	162	66	108	39	152
Hingham, . .	152	116	51	5,012	2,852	616,511	18,165	201	–	322	70	302	730	311
Hull, . . .	6	3	2	256	–	28,200	510	8	–	22	8	15	61	19
Kingston, . . .	84	72	12	2,518	4,466	294,012	4,850	89	–	153	58	75	15	127
Lakeville, . .	121	136	63	5,415	5,532	276,485	5,486	137	1	279	103	243	154	166
Marion, . . .	37	39	22	830	2,360	91,850	2,195	39	–	71	18	30	27	53
Marshfield, . .	111	113	61	6,918	3,970	339,460	7,240	150	–	314	174	226	232	229
Mattapoisett, . .	71	67	33	1,731	3,709	171,960	1,780	77	–	147	72	77	73	129
Middleborough, .	309	291	151	11,874	16,178	653,770	17,230	313	–	716	286	512	203	429

Counties and Towns.	Value of Live Stock.	Wheat, (bush.)	Rye, (bushels.)	Indian Corn, (bushels.)	Oats, (bushels.)	Tobacco, (lbs.)	Wool, (lbs.)	Pease and Beans, (bushels.)	Irish Potatoes, (bushels.)	Sweet Potatoes.	Barley, (bushels.)	Buckwheat, (bushels.)	Value of Orchard Products.	Wine, (gallons.)
Norfolk—*Con.*														
Dedham,	$53,871	–	192	1,960	208	–	–	46	4,267	–	219	–	$40	–
Dorchester,	67,261	–	809	2,262	–	–	–	56	7,060	–	470	–	12,698	289
Dover,	18,800	35	608	4,295	679	–	–	156	5,506	–	778	43	2,065	–
Foxborough,	30,506	57	386	3,418	642	–	–	151	5,972	–	371	–	916	–
Franklin,	37,450	127	891	5,807	2,836	–	–	231	12,343	–	266	33	2,039	–
Medfield,	22,110	123	750	5,241	710	–	–	147	5,352	–	1,553	60	1,390	138
Medway,	31,080	646	1,199	8,931	5,295	–	–	303	12,165	–	490	19	4,386	54
Milton,	54,813	30	1,063	4,883	–	–	–	96	6,021	–	551	–	6,194	137
Needham,	32,278	90	1,409	7,426	460	–	–	118	10,933	–	1,531	10	2,211	–
Quincy,	56,510	–	471	4,879	–	80	–	214	8,206	–	1,232	–	3,055	295
Randolph,	22,165	–	133	1,719	30	–	–	23	3,976	–	210	–	3,006	22
Roxbury,	10,740	–	401	235	–	–	–	6	3,675	–	–	–	9,325	67
Sharon,	21,277	8	170	3,119	116	–	–	51	4,988	–	409	–	61	–
Stoughton,	11,223	–	26	1,646	–	–	–	–	3,290	–	52	–	20	–
Walpole,	36,396	72	801	4,879	969	–	–	189	9,171	–	1,252	7	910	–
Weymouth,	23,195	–	123	2,549	–	–	–	24	5,832	–	533	–	1,918	–

West Roxbury, .	$54,172	1,705	4,082	999	–	–	–	1,266	10,080	175	30	–	$12,715	–
Wrentham, . .	55,841	135	1,305	9,532	3,503	–	330	348	17,111	–	855	25	3,474	–
Totals, . . .	$768,167	3,052	17,559	85,735	17,893	80	843	4,580	166,104	175	12,376	299	$81,568	1,032
PLYMOUTH—*Con.*														
Abington, . .	$36,963	40	184	2,977	205	–	5	33	8,371	–	147	–	$271	–
Bridgewater, . .	37,015	56	665	7,191	3,373	–	–	82	12,884	–	431	31	1,841	–
Carver, . . .	14,077	–	431	2,619	355	–	367	78	2,943	–	14	–	519	–
Duxbury, . .	22,980	89	745	4,813	912	–	41	4	5,335	–	213	16	700	–
East Bridgewater, .	29,480	73	432	3,491	1,078	–	–	57	7,071	–	117	5	997	–
Halifax, . . .	15,859	10	157	2,185	668	–	–	1	3,092	–	179	6	425	–
Hanover, . . .	21,860	28	605	2,684	360	–	274	27	5,507	–	53	–	165	–
Hanson, . . .	16,017	36	285	2,287	520	–	45	–	3,586	–	208	–	291	–
Hingham, . .	49,129	26	852	4,046	207	–	3,960	320	6,370	–	710	–	1,191	9
Hull, . . .	2,985	–	15	370	–	–	375	15	480	–	40	–	105	–
Kingston, . . .	16,992	26	309	2,864	542	–	60	–	3,691	50	31	–	539	–
Lakeville, . .	26,540	14	742	5,500	1,962	–	427	25	6,751	–	12	–	254	–
Marion, . . .	6,507	4	115	1,122	151	–	70	8	1,295	–	–	–	–	–
Marshfield, . .	35,417	113	751	6,162	1,626	–	773	5	6,136	–	318	–	875	–
Mattapoisett, . .	15,451	131	277	2,818	811	–	155	27	3,535	–	43	12	–	–
Middleborough, .	63,366	28	1,368	10,873	4,698	–	487	62	16,344	–	244	–	350	–

Counties and Towns.	Value of Produce Market Gardens.	Butter, (lbs.)	Cheese, (lbs.)	Hay, (tons.)	Clover Seed, (bushels.)	Grass Seeds, (bushels.)	Hops, (lbs.)	Flax, (lbs.)	Flaxseed, (bush.)	Maple Sugar, (lbs.)	Maple Molasses, (gallons.)	Beeswax, (lbs.)	Honey, (lbs.)	Value of Stock on hand April 1, 1865.
NORFOLK—*Con.*														
Dedham,	$2,100	4,559	–	2,132	–	–	–	–	–	–	–	–	–	87,053
Dorchester,	52,520	9,984	–	2,289	–	–	–	–	–	–	–	10	80	14,688
Dover,	70	11,770	500	1,008	–	–	–	–	–	–	–	–	–	3,920
Foxborough,	25	16,500	1,100	1,288	–	–	–	–	–	–	–	–	500	5,528
Franklin,	775	25,410	2,160	2,087	–	–	–	–	–	–	–	8	60	7,871
Medfield,	525	17,210	825	1,321	–	–	–	–	–	–	–	–	–	18,760
Medway,	215	33,635	3,160	2,378	–	26	–	–	–	–	–	–	130	14,112
Milton,	17,015	5,970	1,010	2,528	–	–	3	–	–	–	–	–	425	11,666
Needham,	1,021	17,255	100	2,175	–	–	–	–	–	–	–	–	–	11,933
Quincy,	22,064	6,215	–	2,883	–	–	–	–	–	–	–	–	110	12,061
Randolph,	4,699	5,080	1,100	1,921	–	–	–	–	–	–	–	–	55	4,836
Roxbury,	32,175	1,700	–	469	–	–	–	–	–	–	–	–	–	980
Sharon,	610	10,837	802	1,232	–	–	–	–	–	–	–	–	–	4,212
Stoughton,	–	7,944	827	681	–	–	–	–	–	–	–	–	–	2,737
Walpole,	18	20,760	350	1,899	–	–	–	–	–	–	–	–	–	6,256
Weymouth,	3,823	5,997	1,150	976	–	–	–	–	–	–	–	–	8	6,044

West Roxbury, .	$17,687	6,615	100	2,428	–	–	–	–	–	–	–	–	50	–
Wrentham, . .	175	45,829	3,100	3,527	–	–	–	–	–	–	–	15	120	$12,528
Totals, . . .	$226,166	296,197	19,531	38,701	–	26	3	–	–	–	–	348	1,708	$171,397
PLYMOUTH—*Con.*														
Abington, . .	$811	11,692	2,830	1,610	–	–	–	–	–	–	–	4	32	$51,072
Bridgewater, . .	2,591	23,661	5,310	1,547	3	5	–	–	–	–	–	–	53	12,300
Carver, . . .	2,921	7,019	80	670	–	–	–	–	–	–	–	–	12	3,865
Duxbury, . .	855	15,075	175	1,341	–	–	–	–	–	–	–	11	235	7,254
East Bridgewater, .	3,749	17,443	6,014	1,191	–	–	–	–	–	–	–	–	–	5,514
Halifax, . . .	–	8,835	5,490	749	–	–	–	–	–	–	–	–	–	3,986
Hanover, . . .	–	14,765	4,085	1,166	–	–	–	–	–	–	–	5	108	5,971
Hanson, . . .	403	7,355	1,325	722	–	–	–	–	–	–	–	1	14	4,871
Hingham, . .	4,913	18,974	1,100	2,058	–	–	20	–	–	–	–	16	180	43,488
Hull, . . .	275	1,500	–	112	–	–	–	–	–	–	–	–	–	795
Kingston, . . .	12	7,835	530	865	–	–	–	–	–	–	–	–	20	12,777
Lakeville, . .	460	13,645	3,001	1,106	–	–	–	–	–	–	–	–	–	6,100
Marion, . . .	20	4,430	–	337	–	–	–	–	–	–	–	–	–	1,536
Marshfield, . .	350	21,910	5,430	2,787	–	13	–	–	–	–	–	3	162	9,095
Mattapoisett, . .	32	7,575	–	711	–	–	–	–	–	–	–	–	–	5,809
Middleborough, .	704	31,830	11,748	3,064	–	–	–	–	–	–	–	–	95	15,074

Counties and Towns.	Farms.	Farmers.	Farm Laborers.	Improved land (acres.)	Unimproved land (acres.)	Value of Farms.	Value of Farm Implements & Machinery.	Horses.	Asses and Mules.	Milch Cows.	Work'g Oxen.	Other Cattle.	Sheep.	Swine.
Plymouth—*Con.*														
North Bridgewater,	136	139	60	3,541	4,569	$121,317	$13,087	138	–	352	66	112	1	170
Pembroke,	127	71	74	3,775	3,841	245,850	7,110	123	–	251	108	171	121	156
Plymouth,	93	172	133	3,072	9,676	237,700	8,426	119	–	259	62	129	222	168
Plympton,	9[illegible]	90	11	2,506	3,585	177,781	3,920	80	–	198	80	105	17	108
Rochester,	133	129	76	5,279	8,271	307,800	7,113	134	–	318	68	173	193	201
Scituate,	137	152	48	5,460	1,011	337,010	9,660	159	–	299	120	216	288	211
South Scituate,	92	111	76	2,560	3,661	257,910	7,387	100	–	178	88	161	51	169
Wareham,	42	61	46	1,189	5,266	118,100	2,796	49	–	141	46	53	182	82
West Bridgewater,	107	127	47	4,142	3,009	350,491	10,272	100	–	337	136	84	–	171
Totals,	2,791	2,757	1,327	91,526	115,055	$7,617,257	$185,329	2,997	1	6,112	2,166	3,565	2,951	4,367
Suffolk County.														
Boston,	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Chelsea,	4	27	–	305	6	$115,300	$725	7	–	16	2	24	–	17
North Chelsea,	19	62	–	2,368	219	488,800	12,985	91	–	200	52	75	7	209
Winthrop,	26	36	–	603	12	95,500	3,000	37	–	58	10	23	–	40
Totals,	79	125	–	3,276	237	$729,600	$16,710	135	–	274	61	122	7	266

Worcester Co.														
Ashburnham, . .	91	197	21	6,190	5,131	$201,000	$6,910	135	–	316	139	328	90	146
Athol, . . .	105	156	49	8,715	5,219	242,275	9,120	112	–	358	161	411	96	114
Auburn, . . .	62	76	59	3,032	2,678	189,300	5,578	80	–	267	90	205	39	208
Barre, . . .	214	308	127	18,033	5,387	673,710	19,770	321	–	1,600	355	965	177	402
Berlin, . . .	93	121	17	5,616	1,964	227,675	13,219	128	–	265	116	218	18	276
Blackstone, . .	59	131	22	2,976	2,579	257,200	5,744	86	–	241	82	101	–	119
Bolton, . . .	123	130	65	7,024	3,789	373,200	9,600	158	–	509	138	269	29	305
Boylston, . . .	97	119	40	7,335	2,846	347,770	17,020	130	–	447	118	415	35	352
Brookfield, . .	118	161	27	9,786	3,422	423,250	18,127	194	–	404	211	674	306	277
Charlton, . . .	212	271	52	16,033	6,708	558,220	26,870	250	–	864	301	1,226	269	512
Clinton, . . .	16	18	11	717	416	57,400	1,700	16	–	48	14	32	–	49
Dana, . . .	61	83	26	3,847	3,381	110,125	3,435	89	–	178	101	198	160	58
Douglas, . . .	113	157	72	5,600	5,244	268,850	8,367	130	–	350	168	120	45	180
Dudley, . . .	124	119	72	8,910	4,070	492,300	9,852	176	2	588	201	537	156	308
Fitchburg, . .	202	233	–	9,887	2,291	660,100	18,730	261	2	703	184	441	156	370
Gardner, . . .	62	120	24	4,322	2,878	189,975	4,281	95	–	180	91	238	42	104
Grafton, . . .	130	193	61	8,773	2,739	540,850	18,856	168	–	781	210	306	164	276
Hardwick, . .	189	206	118	11,048	6,578	497,230	13,757	276	–	1,119	299	729	267	516
Harvard, . . .	175	183	69	10,232	6,153	603,300	13,886	215	–	929	182	431	39	309
Holden, . . .	125	202	98	9,221	4,906	371,600	10,909	175	–	501	206	432	126	210

Counties and Towns.	Value of Live Stock.	Wheat, (bush.)	Rye, (bushels.)	Indian Corn, (bushels.)	Oats, (bushels.)	Tobacco, (lbs.)	Wool, (lbs.)	Pease and Beans, (bushels.)	Irish Potatoes, (bushels.)	Sweet Potatoes.	Barley, (bushels.)	Buckwheat, (bushels.)	Value of Orchard Products.	Wine, (gallons.)
Plymouth—*Con.*														
North Bridgewater, .	$30,628	38	452	3,612	767	–	–	34	8,131	–	198	–	$795	–
Pembroke, . .	21,819	118	607	3,217	997	–	413	12	5,635	–	124	–	260	–
Plymouth, . .	24,845	90	781	5,596	1,440	–	469	57	6,511	–	538	21	1,622	–
Plympton, . .	16,908	16	170	2,319	1,018	–	50	2	2,987	–	13	–	371	–
Rochester, . .	25,686	104	1,113	4,721	1,324	–	436	38	5,963	–	229	15	100	–
Scituate, . . .	34,109	40	667	5,028	256	–	1,115	20	5,088	62	612	–	713	3
South Scituate, .	23,299	3	486	2,509	171	–	70	28	3,195	–	195	–	361	–
Wareham, . .	10,717	–	435	1,725	205	–	392	74	3,105	–	41	10	120	–
West Bridgewater, .	28,026	212	764	4,525	1,338	–	–	41	8,653	–	663	–	1,186	–
Totals, . . .	$630,005	1,325	13,138	95,611	25,017	–	9,981	1,053	112,959	112	5,379	119	$11,051	12
Suffolk—*Con.*														
Boston, . . .	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Chelsea, . . .	$2,015	–	106	80	–	–	–	7	135	–	21	–	$625	–
North Chelsea, . .	21,075	–	2,247	2,070	80	–	35	490	5,690	–	303	–	6,300	80
Winthrop, . .	7,105	4	571	1,115	75	–	–	89	1,830	–	530	–	3,505	41
Totals, . . .	$30,225	4	2,924	3,295	155	–	35	586	7,655	–	851	–	$9,120	121

WORCESTER—*Con.*														
Ashburnham, . .	$31,325	1,171	231	2,397	1,568	–	418	116	9,031	–	591	41	$1,066	–
Athol, . . .	38,610	359	406	3,678	2,538	–	394	173	10,115	–	981	168	1,117	154
Auburn, . . .	22,825	408	311	3,760	2,385	–	–	96	5,785	–	144	558	581	–
Barre, . . .	119,013	1,186	1,193	15,181	15,335	–	819	311	25,534	–	3,364	611	4,343	136
Berlin, . . .	36,122	837	486	5,512	1,446	–	52	177	9,479	–	110	83	5,038	73
Blackstone, . .	19,571	116	746	3,603	1,182	–	–	82	7,918	110	10	24	1,112	–
Bolton, . . .	37,122	1,007	868	7,307	2,309	–	125	414	11,981	–	558	299	4,810	85
Boylston, . . .	39,621	1,221	816	7,134	4,151	–	94	286	12,665	–	90	263	7,276	330
Brookfield, . .	53,803	494	879	6,043	6,365	–	1,145	193	12,828	–	378	913	983	50
Charlton, . . .	82,912	312	398	11,574	17,054	–	810	237	16,388	–	1,984	2,138	1,819	15
Clinton, . . .	4,426	114	180	1,280	527	–	–	29	2,685	–	–	40	141	13
Dana, . . .	21,287	285	388	2,667	1,693	–	586	95	5,475	–	93	503	246	29
Douglas, . . .	30,976	57	471	4,412	3,130	–	33	127	11,571	–	153	188	959	–
Dudley, . . .	41,025	195	1,304	7,829	9,088	–	160	119	12,358	–	273	1,183	3,551	–
Fitchburg, . .	57,165	1,628	1,007	10,852	2,883	–	360	281	15,112	–	597	150	6,490	572
Gardner, . . .	23,509	262	111	1,399	465	–	193	73	7,123	–	850	18	242	–
Grafton, . . .	61,730	481	1,053	13,258	11,117	–	600	63	15,765	–	900	230	7,705	125
Hardwick, . .	101,726	783	1,171	9,896	10,130	–	1,912	282	19,192	–	496	639	3,147	313
Harvard, . . .	51,583	1,225	876	10,808	4,778	–	132	537	14,187	–	1,092	237	11,169	53
Holden, . . .	46,138	2,327	813	7,199	2,704	–	477	119	18,275	–	416	129	3,224	45

Counties and Towns.	Value of Products Market Gardens.	Butter, Lbs.	Cheese, Lbs.	Hay, Tons.	Clover Seed, Bushels.	Grass Seeds, Bushels.	Hops, Lbs.	Flax, Lbs.	Flaxseed, Bushels.	Maple Sugar, Lbs.	Maple Molasses, Gallons.	Beeswax, Lbs.	Honey, Lbs.	Value of Slaughter, Local Animals.
Plymouth—*Con.*														
North Bridgewater,	$2,080	21,231	5,132	1,111	1	9	—	—	—	—	—	—	38	$9,206
Pembroke,	1,017	18,101	1,225	1,269	—	18	—	—	—	—	—	20	87	6,315
Plymouth,	8,088	8,832	150	1,084	—	—	—	—	—	—	—	—	—	6,873
Plympton,	40	8,189	1,110	703	—	—	—	—	—	—	—	1	39	4,975
Rochester,	55	15,712	2,500	1,391	—	—	—	—	—	—	—	—	—	8,715
Scituate,	1,968	21,475	4,575	1,763	—	—	—	—	—	—	—	—	185	13,197
South Scituate,	616	10,985	2,511	1,119	—	—	—	—	—	—	—	3	115	12,091
Wareham,	2,200	5,510	8	663	1	11	—	—	—	—	—	3	50	2,130
West Bridgewater,	825	23,578	4,090	1,600	—	18	—	—	—	—	—	3	37	9,938
Totals,	$35,051	317,078	69,112	30,985	1	71	20	—	—	—	—	73	1,153	$203,300
Suffolk—*Con.*														
Boston,	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Chelsea,	$700	520	—	171	—	—	10	—	—	—	—	—	—	$255
North Chelsea,	21,750	1,216	—	2,159	—	—	16	—	—	—	—	35	300	1,195
Winthrop,	6,135	445	—	511	—	—	42	—	—	—	—	3	23	1,368
Totals,	$28,585	2,181	—	2,841	—	—	68	—	—	—	—	38	323	$6,118

WORCESTER—*Con.*														
Ashburnham, . .	$386	18,990	4,150	1,689	–	2	–	–	–	100	70	–	–	$5,99[illegible]
Athol, . . .	125	22,702	15,775	1,946	–	5	900	–	–	421	133	–	453	6,218
Auburn, . . .	–	19,085	3,080	1,228	–	–	–	–	–	–	–	20	120	5,031
Barre, . . .	1,715	40,695	612,789	5,931	–	61	41	–	–	225	105	23	611	15,803
Berlin, . . .	450	31,177	3,255	1,680	–	3	1,900	–	–	–	–	7	115	12,079
Blackstone, . .	1,195	7,015	1,150	1,009	–	–	–	–	–	–	–	–	–	3,020
Bolton, . . .	880	28,767	2,990	2,366	–	305	–	–	–	–	–	–	574	12,928
Boylston, . . .	371	43,596	5,985	1,712	–	42	3,300	–	–	–	–	8	275	15,821
Brookfield, . .	420	28,850	11,415	2,558	–	–	–	–	–	–	–	–	396	11,564
Charlton, . . .	103	50,179	38,742	4,674	–	–	–	–	–	–	–	–	553	17,894
Clinton, . . .	50	2,535	200	243	–	–	–	–	–	–	–	–	100	1,571
Dana, . . .	61	8,875	9,550	929	–	27	–	–	–	–	83	–	325	2,332
Douglas, . . .	500	16,465	4,510	1,384	–	–	–	–	–	–	–	–	–	5,998
Dudley, . . .	–	31,020	26,225	2,900	–	–	–	–	–	–	–	–	–	15,453
Fitchburg, . .	837	56,365	2,529	3,084	40	11	1,450	–	–	–	–	31	171	14,436
Gardner, . . .	770	11,145	4,575	1,040	–	–	–	–	–	315	111	–	21	6,380
Grafton, . . .	492	35,660	4,650	3,724	–	–	–	–	–	–	–	–	–	11,885
Hardwick, . .	75	12,156	331,431	4,999	–	3	1	–	–	–	112	10	403	30,518
Harvard, . . .	2,128	33,014	2,375	3,330	1	351	8,300	–	–	–	–	–	317	14,506
Holden, . . .	267	39,715	6,650	2,576	–	–	–	–	–	–	–	4	528	12,012

Counties and Towns.	Farms.	Farmers.	Farm Laborers.	Improved land, (acres.)	Unimproved land, (acres.)	Value of Farms.	Value of Farm Implements & Machinery.	Horses.	Asses and Mules.	Milch Cows.	Working Oxen.	Other Cattle.	Sheep.	Swine.
Worcester—*Con.*														
Hubbardston,	115	197	33	9,531	5,380	$289,100	$8,525	159	–	501	161	581	182	117
Lancaster,	120	121	75	6,978	3,650	418,550	13,591	135	1	530	132	267	26	262
Leicester,	98	92	29	3,307	3,536	251,960	3,725	113	–	314	98	207	11	177
Leominster,	240	241	–	11,558	3,102	673,950	18,276	262	–	768	205	508	112	439
Lunenburg,	137	157	51	8,314	4,125	409,690	11,673	172	–	537	179	388	116	234
Mendon,	91	115	15	5,277	3,221	307,900	6,197	93	–	360	152	159	21	218
Milford,	76	89	60	4,012	3,061	305,550	7,182	87	–	372	91	118	9	160
Millbury,	77	106	53	4,521	1,949	291,600	10,950	93	2	318	117	240	12	177
New Braintree,	95	106	67	10,590	2,811	257,810	10,150	149	–	1,038	159	432	71	358
Northborough,	116	185	40	,368	2,023	435,810	20,662	163	3	611	136	369	70	271
Northbridge,	67	89	41	3,759	4,039	212,100	5,958	70	–	211	122	151	5	107
N. Brookfield,	125	111	59	7,970	2,539	363,350	9,189	189	–	297	103	323	39	168
Oakham,	106	161	–	7,668	2,811	219,100	8,782	125	–	587	150	301	127	195
Oxford,	118	150	72	6,654	3,830	353,550	9,515	230	–	519	300	426	68	290
Paxton,	55	58	21	4,223	2,882	149,700	3,860	91	–	198	82	236	89	63
Petersham,	157	235	46	13,513	5,109	356,385	11,171	229	–	781	259	710	239	183
Phillipston,	50	103	23	8,367	3,738	186,575	6,075	107	–	318	122	390	61	186

Princeton,	136	215	–	12,517	4,065	$391,350	$13,124	171	–	680	234	785	290	246
Royalston,	144	190	49	14,223	7,900	337,400	9,225	169	–	499	248	753	246	233
Rutland,	137	216	–	9,898	4,863	321,300	10,451	179	–	617	202	648	224	220
Shrewsbury,	130	182	57	7,933	2,255	466,850	14,395	166	–	625	183	428	41	257
Southborough,	139	221	41	7,175	1,302	531,315	21,650	174	–	501	84	271	4	354
Southbridge,	99	128	35	6,868	4,661	396,000	13,965	150	–	424	157	489	241	370
Spencer,	195	209	24	13,740	4,432	445,450	18,690	245	–	567	222	853	210	386
Sterling,	228	194	–	14,738	4,383	651,150	17,861	242	–	962	269	427	231	555
Sturbridge,	162	222	27	12,102	7,070	383,145	15,234	191	–	663	257	945	703	304
Sutton,	161	239	53	9,885	3,167	448,900	14,570	209	–	586	212	437	245	301
Templeton,	124	134	26	9,386	5,330	286,675	8,018	154	–	411	145	391	42	208
Upton,	89	158	33	5,212	2,672	235,875	8,056	110	–	309	120	137	7	191
Uxbridge,	128	209	58	8,310	4,818	410,630	14,622	138	–	532	246	168	31	255
Warren,	106	121	81	11,330	4,813	499,950	10,906	166	–	1,220	203	534	205	351
Webster,	44	73	52	2,406	3,147	138,800	5,050	44	–	200	72	102	10	70
Westborough,	129	190	63	7,121	1,688	469,100	19,599	170	–	861	132	344	1	240
West Boylston,	107	139	30	5,954	1,753	304,157	16,320	153	–	403	97	213	17	299
West Brookfield,	95	122	69	8,428	2,082	316,000	8,106	120	–	604	123	514	195	280
Westminster,	123	191	62	8,559	4,790	343,240	9,650	174	2	451	168	525	130	206
Winchendon,	126	180	82	10,007	6,290	246,675	9,445	133	–	392	168	507	85	246
Worcester,	223	357	161	13,443	4,999	1,728,975	57,143	350	–	1,095	319	627	69	496
Totals,	7,002	9,429	2,760	483,472	223,004	$22,129,577	$668,558	9,280	12	31,930	9,838	24,213	6,726	14,794

Counties and Towns.	Value of Live Stock.	Wheat, (bush.)	Rye, (bushels.)	Indian Corn, (bushels.)	Oats, (bushels.)	Tobacco, (lbs.)	Wool, (lbs.)	Pease and Beans, (bushels.)	Irish Potatoes, (bushels.)	Sweet Potatoes.	Barley, (bushels.)	Buckwheat, (bushels.)	Value of Orchard Products.	Wine, (gallons.)
Worcester—*Con.*														
Hubbardston, . .	$16,577	337	299	4,220	4,585	–	741	138	3,560	–	1,602	–	$365	121
Lancaster, . .	38,632	742	1,130	8,071	2,867	–	122	320	12,822	–	569	661	1,915	35
Leicester,. . .	25,895	93	91	2,542	2,202	–	–	60	8,167	–	485	316	168	–
Leominster, . .	63,895	2,861	1,230	12,395	3,308	–	–	242	17,310	–	1,005	88	9,587	110
Lunenburg, . .	43,161	1,526	458	9,309	2,492	–	423	266	11,253	–	180	345	3,745	21
Mendon, . . .	27,228	147	600	4,741	2,237	–	–	133	8,163	–	302	11	2,900	–
Milford, . . .	23,568	27	367	3,759	1,458	–	–	82	8,024	–	74	–	2,563	–
Millbury, . . .	35,290	396	657	6,607	6,395	–	–	–	10,395	–	223	172	5,759	–
New Braintree, .	68,562	220	886	7,757	7,327	–	403	188	14,530	–	2,741	491	1,774	31
Northborough, . .	57,718	523	775	10,113	2,498	–	568	162	12,535	–	428	286	6,299	207
Northbridge, . .	21,150	46	459	5,110	3,561	–	6	97	7,757	–	52	212	2,167	–
North Brookfield, .	40,290	297	142	5,031	5,299	–	271	164	10,350	–	435	280	1,335	108
Oakham, . . .	37,912	296	642	5,314	5,269	–	451	201	10,123	–	943	156	980	7
Oxford, . . .	36,686	413	588	6,423	5,763	–	–	61	9,906	–	253	639	740	–
Paxton, . . .	19,537	177	80	1,990	2,095	500	205	21	7,414	–	680	158	–	–
Petersham, . .	72,639	911	664	8,074	6,773	–	1,061	188	15,921	–	2,146	225	1,467	47
Phillipston, . .	35,313	865	717	4,515	2,670	–	249	93	13,200	–	948	45	1,360	–

Princeton,	$61,696	2,021	695	6,818	2,453	–	1,201	136	18,735	–	680	127	$2,331	261
Royalston,	57,133	1,171	370	5,435	3,327	–	950	144	10,150	–	2,012	32	1,970	155
Rutland,	53,925	710	111	4,894	5,550	–	1,024	169	19,284	–	1,129	211	601	17
Shrewsbury,	47,487	1,243	667	10,507	6,638	1,600	–	8	11,911	–	392	218	11,530	6,008
Southborough,	62,192	191	208	11,626	5,607	–	51	202	16,507	–	139	25	12,101	218
Southbridge,	46,310	595	346	5,730	3,236	–	1,235	68	9,983	–	575	646	1,812	164
Spencer,	66,455	311	198	8,804	10,916	–	967	222	18,058	–	778	1,161	1,065	–
Sterling,	71,220	2,874	1,021	14,717	4,081	–	–	184	20,736	40	1,095	240	10,557	8
Sturbridge,	63,629	1,696	594	8,507	5,816	–	2,100	176	14,132	–	835	1,104	2,057	–
Sutton,	51,430	146	969	10,785	12,714	–	1,260	106	15,085	–	372	175	5,898	400
Templeton,	10,481	758	400	4,447	2,717	–	191	32	14,030	–	1,973	279	1,685	75
Upton,	25,526	26	663	5,129	3,724	–	35	124	12,323	–	168	513	2,793	–
Uxbridge,	38,790	137	1,124	10,076	7,566	–	158	190	15,573	–	35	89	3,524	10
Warren,	70,391	1,161	594	7,700	7,526	–	656	250	14,705	–	161	444	1,535	52
Webster,	15,335	52	193	2,794	2,424	–	–	49	4,233	–	–	261	351	–
Westborough,	55,650	798	896	14,180	5,568	–	79	30	14,607	–	925	82	7,121	200
West Boylston,	38,487	1,892	651	6,687	2,034	–	–	190	14,398	–	254	201	3,717	82
West Brookfield,	45,630	724	869	6,534	5,815	–	668	147	11,190	–	155	162	1,658	114
Westminster,	39,095	1,329	428	5,335	2,456	–	626	241	14,380	–	862	70	1,853	–
Winchendon,	42,036	1,395	875	4,050	1,530	–	355	174	14,990	–	1,807	211	1,075	–
Worcester,	127,832	2,490	1,772	21,747	13,121	–	336	265	32,460	–	671	448	10,786	183
Totals,	$2,715,268	46,101	37,440	418,928	283,556	2,100	23,868	9,341	743,066	150	41,137	19,295	$193,896	10,630

Counties and Towns.	Value of Produce Market Gardens.	Butter, (lbs.)	Cheese, (lbs.)	Hay, (tons.)	Clover Seed, (bushels.)	Grass Seeds, (bushels.)	Hops, (lbs.)	Flax, (lbs.)	Flaxseed, (bush.)	Maple Sugar, (lbs.)	Maple Molasses, (gallons.)	Beeswax, (lbs.)	Honey, (lbs.)	Value of Slaughtered Animals.
Worcester—*Con.*														
Hubbardston,	873	27,265	32,585	2,228	–	7	–	–	–	–	161	–	220	$6,850
Lancaster,	1,070	22,165	1,705	2,247	–	37	3,500	–	–	–	–	7	176	9,915
Leicester,	–	25,685	1,900	1,511	–	–	–	–	–	–	–	–	–	4,605
Leominster,	921	46,615	2,980	3,819	–	16	–	–	–	150	–	–	130	10,858
Lunenburg,	901	24,115	4,232	2,666	–	21	5,300	–	–	–	–	6	216	11,711
Mendon,	75	17,030	300	1,663	–	–	–	–	–	–	–	–	–	7,313
Milford,	448	8,522	1,840	1,218	–	–	–	–	–	–	–	–	–	6,892
Millbury,	3,505	21,305	3,250	1,914	–	–	–	–	–	–	–	–	–	9,430
New Braintree,	–	16,050	312,325	3,530	–	16	–	–	–	10	28	18	190	22,103
Northborough,	321	33,954	2,380	2,917	–	–	–	–	–	–	–	30	120	17,503
Northbridge,	10	13,100	1,415	1,111	–	76	–	–	–	–	–	–	200	4,896
North Brookfield,	1,046	24,337	32,895	2,631	–	8	–	–	–	–	–	–	70	15,153
Oakham,	170	15,928	60,130	1,865	–	–	–	–	–	–	–	40	85	10,298
Oxford,	–	22,125	9,900	2,067	–	–	–	–	–	–	–	–	–	10,003
Paxton,	45	11,500	7,500	1,175	–	–	–	–	–	–	–	–	35	7,751
Petersham,	371	37,961	97,939	3,081	–	4	–	–	–	136	160	13	860	17,683
Phillipston,	115	31,500	26,725	1,772	–	–	–	–	–	–	–	–	270	6,916

Princeton,	$347	54,307	21,475	2,760	–	–	–	–	–	–	–	–	133	$19,871
Royalston,	185	49,190	19,200	2,601	–	–	–	–	–	200	–	–	510	7,588
Rutland,	161	41,986	19,600	2,936	–	–	–	–	–	–	–	–	85	19,001
Shrewsbury,	380	11,735	2,315	3,191	–	–	25	–	–	–	–	11	75	12,240
Southborough,	2,467	32,331	1,092	2,992	–	–	–	–	–	–	–	–	110	18,436
Southbridge,	–	19,310	22,085	2,372	–	–	–	–	–	–	–	–	270	9,469
Spencer,	–	38,135	28,470	3,312	–	–	–	–	–	–	–	10	470	20,513
Sterling,	5	81,100	3,950	4,512	–	12	2,600	–	–	–	–	7	130	12,458
Sturbridge,	–	38,591	20,375	3,151	–	–	–	–	–	–	–	–	276	20,574
Sutton,	1,501	36,515	15,015	2,929	–	9	–	–	–	–	–	28	460	10,368
Templeton,	125	39,150	11,920	2,071	–	–	–	–	–	–	–	–	575	7,287
Upton,	45	17,866	3,675	1,208	–	12	–	–	–	–	–	9	200	7,053
Uxbridge,	500	25,610	1,680	2,188	–	17	–	–	–	–	–	15	60	8,922
Warren,	–	16,265	107,020	3,644	–	15	–	–	–	–	–	–	460	12,994
Webster,	500	7,075	3,075	905	20	–	–	–	–	–	–	–	–	5,639
Westborough,	1,944	27,500	1,100	3,184	–	–	–	–	–	15	8	–	–	10,265
West Boylston,	770	27,119	1,990	2,177	–	11	–	–	–	4	–	11	307	9,634
West Brookfield,	18	19,010	164,126	5,685	–	1	–	–	–	–	–	–	135	17,219
Westminster,	271	30,260	11,995	2,207	–	5	–	–	–	125	160	4	90	10,405
Winchendon,	205	37,675	10,300	2,293	–	–	–	–	–	–	–	–	225	6,560
Worcester,	12,748	107,750	1,180	6,141	–	12	–	–	–	–	–	31	310	9,926
Totals,	$42,677	1,738,701	2,167,625	149,178	61	1,089	27,317	–	–	1,701	1,164	319	12,379	$660,222

RECAPITULATION.

COUNTIES.	Farms.	Farmers.	Farm Laborers.	Improved land, (acres.)	Unimproved land, (acres.)	Value of Farms.	Value of Farm Implements & Machinery.	Horses.	Asses and Mules.	Milch Cows.	Working Oxen.	Other Cattle.	Sheep.	Swine.
Barnstable, . .	908	1,333	4	33,714	44,613	$2,027,206	$80,854	1,007	5	2,008	529	1,847	1,457	1,370
Berkshire, . .	3,008	3,900	1,887	293,816	143,471	9,819,656	316,988	5,112	3	17,366	3,183	13,279	41,436	8,761
Bristol, . . .	2,208	3,970	1,141	84,156	116,607	6,617,940	221,560	2,621	2	6,781	2,333	3,475	3,158	5,066
Dukes, . . .	266	298	13	22,033	9,469	609,090	15,118	277	–	637	267	808	6,944	373
Essex, . . .	2,718	3,145	1,893	138,319	41,879	10,179,105	346,693	3,273	4	10,532	3,510	4,266	1,816	5,728
Franklin, . .	3,019	4,310	1,192	232,550	112,658	7,918,073	236,994	3,979	1	9,465	3,978	12,831	21,871	5,543
Hampden, . .	2,481	3,152	1,917	190,304	93,257	7,429,961	269,391	3,593	–	10,113	3,596	9,056	8,568	4,376
Hampshire, . .	2,876	3,828	1,121	311,119	67,218	7,736,673	302,111	4,117	1	9,589	2,955	10,960	15,946	5,257
Middlesex, . .	5,400	6,257	3,453	214,207	132,083	24,127,893	851,586	7,495	11	20,806	3,979	9,465	1,060	11,745
Nantucket, . .	130	120	53	6,736	6,381	166,518	12,008	180	–	510	36	258	1,077	292
Norfolk, . . .	2,630	2,868	978	72,057	86,364	15,476,642	277,485	3,610	11	8,019	1,525	2,415	259	6,902
Plymouth, . .	2,794	2,757	1,327	91,526	115,055	7,647,257	185,329	2,997	1	6,412	2,166	3,565	2,954	4,367
Suffolk, . . .	79	125	–	3,276	237	729,600	16,710	135	–	274	64	122	7	266
Worcester, . .	7,002	9,129	2,760	483,472	223,001	22,129,577	668,558	9,280	12	31,930	9,838	24,213	6,726	14,794
Totals, . .	35,519	45,522	18,039	2,213,315	1,192,296	$122,645,221	$3,804,385	47,679	51	131,475	37,989	96,563	113,279	74,843

RECAPITULATION—Continued.

COUNTIES.	Value of Live Stock.	Wheat, (bush.)	Rye, (bushels.)	Indian Corn, (bushels.)	Oats, (bushels.)	Tobacco, (lbs.)	Wool, (lbs.)	Pease and Beans, (bushels.)	Irish Potatoes, (bushels.)	Sweet Potatoes.	Barley, (bushels.)	Buckwheat, (bushels.)	Value of Orchard Products.	Wine, (gallons.)
Barnstable, . .	$209,572	1,433	10,233	49,460	9,106	–	2,917	1,642	30,926	40	3,392	174	$2,644	273
Berkshire, . .	1,584,823	12,530	59,285	172,305	340,252	3,625	145,716	3,214	360,734	–	8,602	41,914	27,417	646
Bristol, . . .	594,021	864	15,176	121,092	51,973	–	7,442	1,148	167,311	20	7,644	162	17,906	465
Dukes, . . .	52,533	25	1,059	10,834	4,001	–	19,234	26	12,520	2	78	10	380	–
Essex, . . .	865,962	2,015	13,276	151,807	39,950	1,625	4,016	5,795	260,114	348	29,375	331	122,981	1,694
Franklin, . .	1,159,157	24,629	44,706	215,757	100,206	914,550	72,566	2,002	215,035	–	3,278	5,345	47,491	704
Hampden, . .	993,547	6,280	74,700	180,928	97,380	1,186,262	25,783	2,097	269,128	12	1,632	31,226	33,078	1,560
Hampshire, . .	1,082,578	12,091	57,600	245,304	70,993	1,113,689	55,273	747	267,052	–	1,913	10,586	48,203	380
Middlesex, . .	1,807,874	9,796	42,032	324,272	106,651	10	3,155	10,846	554,408	–	17,018	3,917	326,075	4,331
Nantucket, . .	31,468	149	182	8,709	945	–	2,957	129	5,079	50	810	–	30	–
Norfolk, . . .	768,167	3,052	17,559	85,735	17,893	80	843	4,580	166,404	175	12,376	299	84,568	1,032
Plymouth, . .	630,005	1,325	13,138	95,614	25,017	–	9,984	1,053	142,959	112	5,379	119	14,051	12
Suffolk, . . .	30,225	4	2,924	3,295	155	–	35	586	7,655	–	854	–	9,420	124
Worcester, . .	2,715,268	46,101	37,440	418,928	283,556	2,100	23,868	9,341	743,066	150	41,137	19,295	193,896	10,630
Totals, . .	$12,525,200	120,291	389,610	2,084,040	1,148,081	3,221,941	373,789	43,206	3,202,391	909	133,488	113,408	$928,140	21,854

RECAPITULATION—Concluded.

COUNTIES.	Value of Produce Market Gardens.	Butter, (lbs.)	Cheese, (lbs.)	Hay, (tons.)	Clover Seed, (bushels.)	Grass Seeds, (bushels.)	Hops, (lbs.)	Flax, (lbs.)	Flaxseed, bush.)	Maple Sugar, (lbs.)	Maple Molasses, (gallons.)	Beeswax, (lbs.)	Honey, (lbs.)	Value of Slaughtered Animals.
Barnstable, . .	$11,651	76,424	4,877	11,118	–	21	–	–	–	–	–	–	175	$53,915
Berkshire, . .	12,872	1,336,926	2,103,716	87,955	163	184	25,845	15	2	332,222	5,182	1,231	16,856	300,615
Bristol, . . .	40,200	234,401	44,596	28,312	8	436	–	–	–	–	–	182	2,162	223,214
Dukes, . . .	15	22,876	1,910	2,605	–	–	–	–	–	–	–	–	–	17,200
Essex, . . .	171,243	438,004	58,572	55,677	–	306	1	–	–	–	–	104	2,147	251,306
Franklin, . .	1,227	917,235	229,773	59,557	8	82	19,470	90	2	387,093	5,800	519	5,697	222,205
Hampden, . .	30,781	767,378	429,592	47,382	89	680	169	70	3	93,170	1,319	288	9,240	197,193
Hampshire, . .	3,285	1,161,770	321,493	55,126	100	150	30	–	–	197,083	1,500	113	2,199	169,711
Middlesex, . .	771,231	806,039	55,811	96,118	20	1,846	38,386	–	–	–	160	179	4,781	501,131
Nantucket, . .	5,183	23,767	–	2,440	–	–	–	–	–	–	–	–	–	5,674
Norfolk, . . .	226,166	296,197	19,531	38,701	–	26	3	–	–	–	–	318	1,708	171,397
Plymouth, . .	35,051	317,078	69,112	30,985	4	71	20	–	–	–	–	73	1,153	263,300
Suffolk, . . .	28,585	2,181	. –	2,811	–	–	68	–	–	–	–	38	323	6,118
Worcester, . .	42,677	1,738,701	2,167,625	119,178	61	1,089	27,317	–	–	1,701	1,161	349	12,379	660,222
Totals, . .	$1,383,176	8,168,980	5,509,614	668,628	453	4,894	111,309	175	7	1,011,569	15,425	3,457	59,420	$3,046,861

REMARKS.

The preceding table exhibits the number of farms, farmers, farm laborers, acres of improved and unimproved land, cash value of farms and of farm implements and machinery, number of horses, asses and mules, cows, oxen, other cattle, sheep and swine, value of live stock, bushels of wheat, rye, corn, oats, pease and beans, Irish potatoes, sweet potatoes, barley, buckwheat and grass seeds, pounds of tobacco, wool, butter, cheese, clover seed, hops, flax, flaxseed, maple sugar, beeswax and honey, gallons of wine and maple molasses, tons of hay, value of orchard products and produce of market gardens, and value of slaughtered animals, for each town in the Commonwealth of Massachusetts, as exhibited by the official returns of the Eighth (1860) United States Census.

The table does not include returns from Lawrence, Essex County, or Provincetown, Barnstable County, as none of either of these towns were returned by the marshals.

The following items, relating to the milk business, are not included in the preceding table. They comprise all the references to this important product to be found in the official returns.

In Taunton, 35 farmers sell milk; in Springfield, 9; in Bridgewater, 16; in North Bridgewater, 16; in Fitchburg, 28; in Leominster, 57. In Agawam, $900 worth of milk is sold annually; in Ware, $2,000; in Warren, $40,000. In West Bridgewater, four farmers sold $2,090 worth of milk. The towns of Canton, Sharon, Stoughton and Dedham, send to market 468,000 gallons of milk annually.

The number of "farmers," as given in the table, does not include *females* returned as farmers. Of these there are, perhaps, twenty in the State. The number returned as "farm laborers," is hardly more than an approximation to the number of those whose principal employment is upon the farm, as laborers for hire,—if even that. Some of the marshals return all laborers, as simply "laborers;" others return such as "day laborers;" and others, as "farm laborers." In some cases farmers' sons are returned as "farm laborers;" in others, as "laborers;" in others, as "help;" and in others, no occupation is given. This will account for the great discrepancy in the returns of the various towns. For instance, in Fitchburg, with 202 farms, and 233 farmers, no farm laborers are returned; and the same is the case with the adjoining town of Leominster.

New Braintree, with 95 farms, returns 67 farm laborers; while in the adjoining town of Oakham, with 106 farms, none are returned.

These returns, while they are of great value relatively, are yet so far from the actual truth, as to be nearly valueless, except for purposes of comparison, and it is to be regretted that some more perfect plan has not been adopted in these investigations. But so long as the work is entrusted to political favorites, irrespective of other qualifications, rather than to persons specially fitted for such labor, we may well despair of reaching even an approximation to the truth. Among the many particular instances which might be cited to show the careless and untrustworthy manner in which these returns are collected by the assistant marshals, the following are deemed sufficient for illustration:

The assistant marshal for Haverhill and adjacent towns, returns as his own, twenty-five acres improved land, at a valuation of one thousand dollars; while the assessors of his town value his real estate at $4,450. The same marshal returns a neighbor as the owner of 205 acres of land, (180 acres of it improved) at a valuation of only $700, while the assessors appraise it at $8,150! If it be claimed that the marshal had no power to correct any statement given him in the one case, it still remains true that he should have returned a true "cash value" for his own property. In the returns for the same town not a single ton of hay is returned among the products of *forty farms!*

In the returns of products for the town of Westfield, 4,000 pounds of *rice* are given; for Mendon, 273; for Stow, 90; for Rowley, 10 pounds. Believing these entries to be incorrect, the several persons so reported as rice producers, have been interrogated by this department, and the result confirms previous belief. One who was returned as having raised 2,500 pounds of rice, declares the statement to be "a mistake," as he "never raised *any* rice." Another, reported to have raised 90 pounds, affirms it to be "a *great* mistake," as he "never raised any." A third, reported to have raised the modest amount of ten pounds, replies that it is "an *entire* mistake." And so of the others!

In the returns for the town of Stoughton, no valuation is carried out for six farms. In those for Amherst, no *acres* are returned for seventeen farms.

To show that the above are not isolated cases of gross errors and imperfections in the census returns, the following table has been prepared. It exhibits the total number of tons of hay annually produced, and the number of horses, cows, sheep and swine, returned for each county, by the assessors of the several cities and towns, and also by the marshal of the United States census,—the two returns being taken at the same time or at very nearly the same time, and referring to the same year.

COUNTIES.	HAY. Annual Produce in Tons.			HORSES. Total Number Returned.			COWS. Total Number Returned.			SHEEP. Total Number Returned.			SWINE. Total Number Returned.		
	U. S. Census.	Assessors.	Difference.	U. S. Census.	Assessors.	Difference.	U. S. Census.	Assessors.	Difference.	U. S. Census.	Assessors.	Difference.	U. S. Census.	Assessors.	Difference.
Barnstable, . .	11,118	12,979	1,861	1,007	2,205	1,198	2,008	3,712	1,704	1,457	1,136	321	1,370	1,367	3
Berkshire, . .	87,955	87,152	803	5,112	7,584	2,472	17,366	20,066	2,700	41,436	41,988	952	8,764	5,176	3,588
Bristol, . . .	28,312	38,942	10,600	2,624	6,315	3,691	6,784	9,719	2,935	3,158	3,560	402	5,066	6,090	1,024
Dukes, . . .	2,605	2,941	336	277	400	123	637	789	152	6,944	9,276	2,332	373	367	6
Essex, . . .	55,677	66,652	975	3,273	8,039	4,766	10,532	13,240	2,708	1,816	4,278	2,462	5,728	1,717	4,011
Franklin, . .	59,557	50,940	8,617	3,979	5,086	1,107	9,465	10,985	1,520	21,871	19,182	2,689	5,543	4,018	1,525
Hampden, . .	47,382	52,920	5,538	3,593	5,481	1,888	10,113	11,043	930	8,568	8,563	5	4,376	4,352	24
Hampshire, . .	55,426	51,251	4,175	4,117	5,201	1,084	9,589	10,858	1,269	15,946	15,611	335	5,257	4,493	764
Middlesex, . .	96,118	95,368	750	7,495	14,867	7,372	20,806	24,549	3,743	1,060	1,174	114	11,745	8,816	2,929
Nantucket, . .	2,440	2,189	251	180	289	109	540	531	9	1,077	1,014	63	292	143	149
Norfolk, . . .	38,701	47,680	8,979	3,610	9,095	5,485	8,019	10,524	2,505	259	366	107	6,902	6,438	461
Plymouth, . .	30,985	35,378	4,393	2,997	5,364	2,367	6,412	7,988	1,576	2,954	3,215	261	4,367	4,116	251
Suffolk, . . .	2,844	3,248	404	135	5,602	5,467	274	549	275	7	1	6	266	205	61
Worcester, . .	149,478	154,645	5,167	9,280	15,184	5,904	31,930	36,429	4,499	6,726	6,307	419	14,794	9,943	4,851
Totals, . .	668,628	702,285	33,657	47,679	90,712	23,033	134,475	160,982	26,507	113,279	115,671	2,392	74,843	57,241	17,602

From the above table it is seen that the assessors, who may safely be considered as the most trustworthy authority, return 33,657 more tons of hay, 23,033 more horses, 26,507 more cows, 2,392 more sheep, and 17,602 *less* swine, than the marshals. It should, however, be stated, rather as a serious defect in the census blanks, than as a fault of the marshals, that there appears to be no appropriate schedules for the return of horses, cows, &c., owned by persons other than farmers, and consequently but few, or none, such are returned. Thus we find no horses returned by the marshals for Boston, while the assessors for the same year return 5,111. This alone makes a difference in the valuation of that city, of $766,650; or a difference in the valuation of the State, of $1,865,673 in one item! Add the difference in the returns of cows, swine and hay, and it increases the valuation of the State, $3,036,844. It is to be hoped that before another decennial census shall be undertaken, some means may be adopted by which these, and many other glaring defects, may be remedied.

The following table exhibits, in round numbers, the average number of acres per farm, (both of improved and unimproved land.) and also the average value of farms, farm implements and machinery, and live stock, in each county in the State:—

COUNTIES.	Average number of acres of land per Farm.	Average number acres improved land per Farm.	Avge No. acres of unimproved land per Farm.	Average value of Farms.	Avg. value Farm Implements & Machinery per Farm.	Average value of Live Stock per Farm.
Barnstable,	87	37	50	$2,231	$89 04	$230 76
Berkshire,	146	98	48	3,272	105 38	526 87
Bristol,	92	38	54	2,061	100 34	269 03
Dukes,	119	83	36	2,288	56 83	197 48
Essex,	67	51	16	3,743	127 55	318 23
Franklin,	115	77	38	2,621	78 50	383 95
Hampden,	115	77	38	2,993	108 58	400 46
Hampshire,	134	109	25	2,688	105 04	376 42
Middlesex,	71	45	26	4,392	158 25	334 79
Nantucket,	102	52	50	1,280	92 37	242 00
Norfolk,	61	27	31	5,883	105 50	292 08
Plymouth,	76	34	42	2,771	62 75	225 48
Suffolk,	45	41	4	9,233	211 52	382 59
Worcester,	102	69	33	3,158	95 49	387 79
Total average,	95	60	35	$3,453	$107 10	$355 45

From this it appears that the average value of the farms in the State, including farm implements and machinery, and live stock, is $3,884.58. The average yearly produce of hay per farm, is a fraction less than nineteen tons. The average number of milch cows per farm, is a fraction less than four; of sheep, a little more than three; of swine, two. The average annual produce of butter per cow, is a little less than seven pounds; of cheese, about five pounds. These last estimates cannot fail to impress upon the mind the fact already alluded to,—the imperfect character of the census returns. And yet these items, and such as these, are to be laid before our own people, before the people of other States, and before the world, *as the results of official inquiries into the present condition of the Agriculture of Massachusetts!*

The following table exhibits the number of acres of land devoted to orcharding in each county in the State; the number of acres of orcharding mowed; number of tons of hay, the yearly produce of orcharding mowed; the yearly value of orchard products; and the yearly value, per acre, of orchard (fruit) products:—

COUNTIES.	Acres of Orcharding of all kinds of Fruits. Assessors, 1860.	Acres of Orcharding mowed. Assessors, 1860.	Tons of Hay, the yearly produce of Orchard'g mowed. Assessors, 1860.	Yearly Value of Orchard Products. U. S. Census, 1860.	Yearly Value per acre of Orchard Products, (Fruit.) Combined returns, 1860.
Barnstable,	510	62	65	$2,644	$5 18
Berkshire,	3,256	2,143	2,321	27,417	8 42
Bristol,	3,039	725	476	17,906	5 89
Dukes,	126	30	28	380	3 02
Essex,	3,307	1,841	1,548	122,981	3 72
Franklin,	2,378	1,675	1,649	47,491	2 03
Hampden,	3,323	1,766	1,917	33,078	9 95
Hampshire,	2,720	1,595	1,671	48,203	1 77
Middlesex,	8,964	6,634	5,927	326,075	3 64
Nantucket,	–	–	–	30	–
Norfolk,	2,760	1,980	1,811	84,568	3 06
Plymouth,	2,643	779	628	14,051	5 31
Suffolk,	178	154	179	9,420	5 29
Worcester,	8,548	5,996	5,791	193,896	2 27
Totals,	41,752	25,380	24,011	928,140	–

From this table it appears that the average yearly value per acre of the fruit products of orchards is only $4.58; and the average yearly value per farm is $26.13.

The following table exhibits the schedule of valuation of the various descriptions of land in the State, as adopted by the "Valuation Committee" of 1860:—

COUNTIES.	SAMPLE TOWNS.	Tillage land, (per acre.)	Upland mowing, (per acre.)	Orcharding, (per acre.)	Fresh meadow, (per acre.)	Salt marsh, (per acre.)	Pasture land, (per acre.)	Wood land, (per acre.)	Unimproved land, (per acre.)	Horses.
Barnstable,	Yarmouth,	$30	$50	$60	$20	$15	$10	$12	$3	$60
Berkshire,	Lanesborough,	30	35	50	20	–	12	20	5	60
Bristol,	Mansfield,	30	30	90	20	–	15	20	5	60
Dukes,	Tisbury,	30	35	50	20	20	12	15	3	65
Essex,	W. Newbury,	60	60	200	25	–	25	40	10	70
Franklin,	Montague,	30	40	50	–	–	12	25	5	65
Hampden,	Palmer,	30	45	50	20	–	12	40	5	70
Hampshire,	Williamsburg,	35	40	50	15	–	12	40	8	75
Middlesex,	Framingham,	50	55	200	20	–	25	55	15	75
Nantucket,	. . .	40	40	–	40	16	10	10	2	75
Norfolk,	Braintree,	90	90	100	20	40	25	35	12	75
Plymouth,	Bridgewater,	40	50	150	25	–	16	30	6	65
Suffolk,	. . .	–	–	–	–	–	200	–	–	150
Worcester,	Shrewsbury,	50	50	150	18	–	22	40	10	70
Average throughout State,		42	48	100	22	23	18	29	7	81

The committee valued asses and mules at $40 each, cows $25, working oxen $40, steers and heifers $10, sheep $2, and swine $6, *throughout the Commonwealth.* Horses in Boston were valued at $150, and in other parts of Suffolk County at $100.

The following table, compiled from the official report of the above named committee, exhibits the number of acres of each description of land in the several counties, and the total aggregates of the same:—

COUNTIES.	Acres of land annually tilled, excluding orcharding tilled.	Acres of orcharding of all kinds of fruits.	Acres of upland mowing, excluding orcharding mowed.	Acres of fresh meadow.	Acres of salt marsh.	Acres of pasture land, excluding orcharding pastured.	Acres of woodland, exclusive of pasture land inclosed.	Acres of unimproved land.	Acres of land unimprovable.	Acres of land used for roads.	Acres of land covered with water.	Whole number of acres of land in the county, from actual survey.
Barnstable, . . .	5,955	510	4,071	1,928	7,179	35,537	66,123	29,376	13,457	3,551	37,890	220,824
Berkshire, . . .	32,106	3,246	76,803	10,250	–	168,437	103,643	86,904	53,027	11,696	11,857	–
Bristol, . . .	17,946	3,039	41,753	8,850	2,277	70,385	113,100	43,360	4,891	7,437	13,567	364,072
Dukes, . . .	1,422	126	1,833	464	433	21,539	10,851	9,437	979	390	7,511	55,531
Essex, ...	17,338	3,293	41,193	13,947	15,836	94,768	46,611	27,558	6,731	9,039	17,723	311,014
Franklin, . . .	19,665	2,375	47,178	5,481	–	139,985	62,660	78,347	40,165	8,919	8,605	430,783
Hampden, . . .	34,130	3,323	34,398	10,816	–	100,201	55,828	72,821	36,111	8,734	7,574	382,606
Hampshire, . . .	26,146	2,715	42,175	10,082	–	116,017	47,633	57,988	19,625	7,920	11,344	358,136
Middlesex, . . .	39,693	8,964	68,576	32,631	2,106	128,654	100,615	90,487	6,378	14,548	16,558	449,097
Nantucket, . . .	585	–	1,033	278	173	2,318	300	18,387	3,827	430	1,050	30,590
Norfolk, . . .	12,576	2,760	38,293	15,787	2,320	62,961	63,935	45,578	3,273	6,695	7,861	250,111
Plymouth, . . .	14,227	2,643	27,340	10,598	6,230	69,279	132,050	81,525	6,865	8,117	26,430	394,117
Suffolk, . . .	437	178	1,135	–	1,989	1,560	84	292	17	816	700	5,178
Worcester, . . .	43,310	8,640	122,402	35,247	–	333,273	172,638	124,959	32,781	21,648	29,575	951,759
Totals, . . .	265,576	41,812	550,183	156,359	38,543	1,344,914	976,071	767,019	229,130	109,940	198,254	4,770,903

INDEX

TO THE ABSTRACT.