Public Documents of Maine:

BEING THE

ANNUAL REPORTS

OF THE VARIOUS

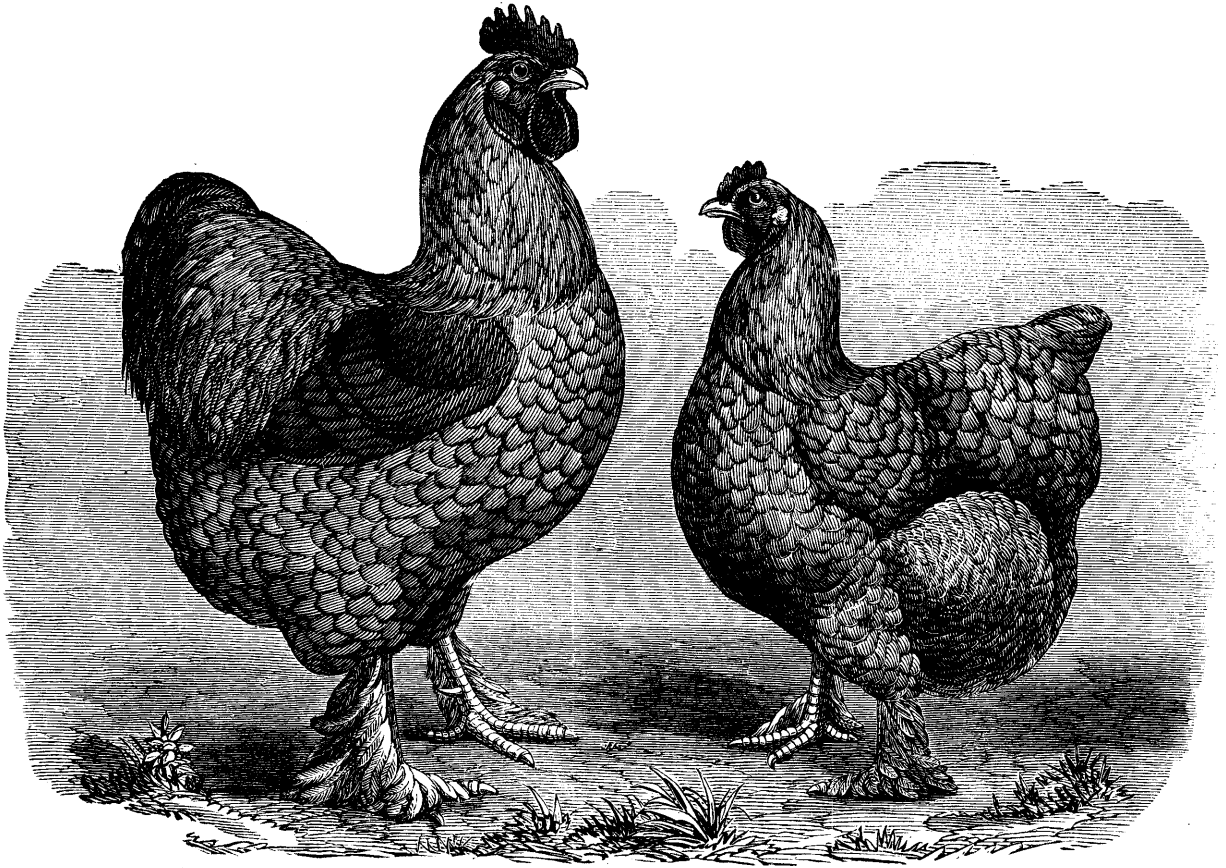
PUBLIC OFFICERS AND INSTITUTIONS

FOR THE YEAR

1874.

VOLUME II.

AUGUSTA:
SPRAGUE, OWEN & NASH, PRINTERS TO THE STATE.
1874.



Pure bred Buff Cochin Fowls, owned by Fred Atwood, Winterport, Maine.

EIGHTEENTH ANNUAL REPORT

OF THE

SECRETARY

OF THE

MAINE BOARD OF AGRICULTURE,

FOR THE YEAR

1873.

AUGUSTA:
SPRAGUE, OWEN & NASH, PRINTERS TO THE STATE.
1873.

OFFICE OF THE MAINE BOARD OF AGRICULTURE,
AUGUSTA, January 1st, 1874.

To the Honorable Senate

and House of Representatives:

I have the honor to transmit, herewith, the Annual Report of the Maine Board of Agriculture for the year 1873.

Very respectfully,

Your obedient servant,

SAMUEL L. BOARDMAN,

Secretary.

BOARD OF AGRICULTURE.

WARREN PERCIVAL, PRESIDENT.
LORIN ADAMS, VICE PRESIDENT.
SAMUEL L. BOARDMAN, SECRETARY.

MEMBERS AT LARGE APPOINTED BY GOVERNOR AND COUNCIL.

Name.	P. O. Address.	Term Expires Dec. 31,
C. F. Allen	Orono	——
M. C. Fernald	Orono	——
D. M. Dunham	Bangor	1874
George E. Brackett	Belfast	1876

MEMBER CHOSEN BY STATE AGRICULTURAL SOCIETY.

Warren Percival	Cross' Hill	1874

MEMBER CHOSEN BY STATE POMOLOGICAL SOCIETY.

Hannibal Belcher	Farmington	1875

MEMBERS CHOSEN BY COUNTY SOCIETIES.

Name.	County.	P. O. Address.	
Samuel Wasson	Hancock	East Surry	1873
A. L. Simpson	Penobscot	Bangor	1873
Lorin Adams	Franklin	East Wilton	1873
A. M. Robinson	Piscataquis	Dover	1873
Silas Hawes	Knox	Union	1873
Elisha E. Parkhurst	Aroostook	Maysville	1873
Horace Colburn	Kennebec	Windsor	1874
Z. A. Gilbert	Androscoggin	East Turner	1874
J. W. Lang	Waldo	Brooks	1874
W. R. Waterman	Washington	Robbinston	1874
Lyman H. Winslow	Lincoln	Nobleboro'	1874
Ira C. Doe	York	Saco	1875
George B. Barrows	Oxford	Fryeburg	1875
Edward Payson	Cumberland	Portland	1875
Wm. D. Hayden	Somerset	Madison Centre	1875
Isaac E. Mallett	Sagadahoc	Topsham	1875

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MAINE BOARD OF AGRICULTURE.

REPORT OF THE WINTER SESSION.

The winter session of the Board of Agriculture was held in the Town Hall, in Winthrop, January 14th to 17th, 1873. The meetings were fully attended and much interest manifested in the addresses and discussions.

In many respects it was peculiarly appropriate that a meeting of the Board of Agriculture should be held at this place. It was here that improved agriculture in our State had its birth, and here those powerful agencies for its promotion and advancement—the agricultural press and the agricultural society—were first put in operation. As early as 1787 an agricultural society was established in Winthrop, the first of its kind in New England and the second in all North America. This society, under two or three different names, has maintained its organization to the present time. In the early years of its existence the officers of the present society carried on an extended correspondence with the leading farmers of the country, and in 1826 imported twenty-five bushels of seed wheat direct from Gibraltar, in Spain, which was distributed among the members of the society. In 1834 it imported oats from Scotland. This early society was also one of the first associations in Maine to engage in the suppression of the sale and use of intoxicating spirits, as in 1834 it passed a vote by which it "decidedly disapproved of the sale of ardent spirits on the grounds occupied by them on the days of their cattle show." The first agricultural paper in Maine was also started in Winthrop in 1833, called the *Kennebec Farmer*, which name was very soon afterward changed to *Maine Farmer*. So it seemed essentially fitting that the State Board of Agriculture should hold a session in this old town, and, as the representative of the several agricultural societies of the State, go back to the cradle of the present society to honor its work and do reverence to the memories of those men who,

so much in advance of their time, established the first agricultural society in our State, and labored for the improvement of Maine farming, and for "the elevation of the calling of the husbandman."

After the organization, the first day was devoted to a discussion of the advisability of organizing a State Fruit Growers' Association. It resulted in the establishment of such a society, as will be seen by reference to the act of the Legislature incorporating the same, published in a subsequent portion of this report.

SECOND DAY.

WEDNESDAY, January 15.

Major Lorin Adams, Vice President, in the chair. The first paper of the morning session was on

MIXED HUSBANDRY.

BY SILAS HAWES, MEMBER FROM KNOX COUNTY.

In pursuing the discussion of the general topic for our consideration at this time: "What crops shall we grow, and how shall we dispose of them," I shall add my mite and advocate my belief in the subject which I propose to treat during the time allotted me. I very well know my views will conflict with the wise counsels of some, and jostle against the fine theories of others; but while I accord to them a wide margin of vantage ground, must reserve at least a small one for myself, and propose to use it at this time for the vindication of mixed farming. This I believe to be the only safe path for the Maine farmers to pursue, and I also believe if there is any safe path we should pursue it and counsel it to others. "In a multitude of counsellors there is safety;" and from the counsels here given, and elsewhere by the Board of Agriculture, the agricultural press, Farmers' Clubs, experience, experiment, and observation, let us draw correct deductions that shall be guides to us on the road of progress.

No one crop is safe enough for a specialty. I give this as a general proposition, and I shall endeavor to make good my assertion. Take any crop we cultivate, grass, corn, potatoes, wheat, fruit, dairy products, and what becomes of rotation if we cultivate one crop? If I rightly interpret the matter, the superior state of farming in England is due, in a great degree, to the judicious system of rotation of crops there pursued. Specialties look well on paper, sound well in a lecture, read well in a report—but are they

wise and practicable—are they adapted to the wants and conditions of the average of Maine farmers? If so, I hope some good brother will enlighten us, and not only enlighten but prove that such is the fact. I contend that specialties, with rare exceptions, are not adapted to our wants, situation, or general condition. Take whatever crop you please and tell me if it is sure under any treatment for any ten years you may choose consecutively? In mixed farming, if one crop fails the climatic conditions that caused the failure are auspicious for the perfection of some other. A wet season that produces a good hay crop, militates against the potato crop; a dry season which perfects the potato crop, cuts off our grain and hay to a considerable extent. The fruit crop is a noted one for fluctuations. Dairying, to be pursued with profit, depends on the seasons production of forage, and so on to the end of the chapter. Specialties are pretty in theory, but bad in practice. We must buy all we do not produce; if we raise but one, two, or three kinds of products, we must buy all the rest, and we should not buy what we can produce on our farms. This is the teaching of prudence and economy; shall we listen to it, or run to specialties?

Prices of labor will not admit of economically engaging in specialties. If our farming operations exceed a certain range, we must hire help. If we have more to do than we can perform ourselves, we must have extra labor. This labor is costly and must be paid for; and to get money to pay it we must sell some product. If we run specialties and they fail, we are unable to pay. If, on the other hand, we adhere to mixed farming, and one crop fails, another is good; and if one falls below an average, another rises above the average, so we maintain the equilibrium and have a surplus to sell, of some kind, and the laborer receives his hire.

Again: It takes more skill to run a specialty than a variety; it takes more skill to train and drive the trotter than the horse of all work. We have been educated in the way of mixed farming, and it is not easy to change. We cannot procure skilled labor for specialties at profitable rates, and it will not pay to run them with the aid of unskilled laborers. If the eggs are all in one basket, we want to know who carries the basket. There is not demand at present for the products of a certain crop to induce us to stake all upon one or two crops. The time may come, and perhaps is near at hand, near good markets and easy transportation, for some to run to specialties; but for the farmers of the State, as a whole,

mixed farming must and will continue for years to be the leading pursuit. If we pursue specialties it must be in the broadest sense, and in fact such as to be what I consider a near approach to mixed farming. If a specialty is followed, it must be such a system as will embrace a judicious rotation of at least two or three leading, perhaps exclusive, crops.

I now propose to notice some leading crops which should receive more attention in our system of mixed husbandry.

Pay more attention to the grass crop. First and foremost, underlying, and overtopping, and supporting every other crop, this deserves our deepest thoughts and wisest counsels. A natural product of our State, growing upon every hill top, clothing every vale, in numerous varieties and of superior excellence to the grass products of other States; we occupy a preeminent and permanent position for the production of this crop. That its acreage is yearly extended while its product per acre decreases, is to our shame. We produce far less of this crop in Maine than we might. We use too few kinds of seed in seeding our fields down for the production of a good crop; in many instances we put the seed too deep, and thereby lose much. We often use too small a quantity of seed. These are general points upon which we have need to examine and improve our practice. We do not manure our grass lands enough, but apply our available manure to the hoed crops to too great an extent. Let us examine a too common practice: We plow up the poorest piece in our field, one which has almost ceased to grow grass. Did you ever know a farmer to pick out his best pieces of grass and plow them up for planting ground? No; the poorest piece is taken up and cropped usually with corn or potatoes. The first year of course it is manured, but considering its needs the portion applied is not large, or at least so large as it should be. The second year it is sown to grain and grass seed, and in nine cases out of ten, without any fertilizer whatever. Two crops taken off for one manuring and the land left to bear successive crops of grass for hay without further attention. It is actually poorer than when first taken up, and we wonder why we did not get any better catch. The wonder is that we get any. We did not deserve any after our shabby treatment of it.

We should give attention to draining our low lands, swales, and those rich grass-producing lands of which more or less is found upon nearly every farm. We want to avail ourselves of every means in our power to swell our hay-mows and increase the capa-

bilities of our pasturing. Top-dressing, draining, reseeding and restocking with new and valuable grasses, deserves our best efforts and our earnest thoughts. This is the specialty I would make above all others, in my system of mixed farming: to produce the greatest amount of grass possible from our farms, and when produced, I would not bale it up and ship it to Boston, but would feed it out to good stock, in whose growth there is profit, and whose manure should go to render my acres still more fertile and my production of hay still greater. In mixed husbandry we cannot sell hay and thrive; it is an impossibility. We might as well sell our clothing and try to keep warm and comfortable. We must have manure and a judicious rotation of crops; and no rotation can be successful without manure.

Another point I wish to make here is, do not crop too long after seeding down. Do not crop year after year, till the roots are weakened and the soil reduced in fertility—but plow up, cultivate, manure, and renew. Do not reduce your soil to a point below zero before attempting to recuperate and renew.

I have dwelt upon the production of grass because I would impress its importance, because there is a lack of attention to this fundimental crop upon which our farming operations must ever depend, and which is, all things taken into consideration, that crop which produces one-half the value of all the vegetable products of the State. We do not realize one-half the power our soil possesses to produce grass; in no one place or point has a limit been reached, nor its full capacity developed.

I wish next to call your attention to stock—for if we have hay and pasturage we must have something to consume it. Now that something can be either good or bad, paying or not paying—and which it shall be depends upon our own personal efforts. It is just as cheap to keep a good animal as it is to keep a poor one. I go against "scrub stock" every time. Select the best blood and breed up to your ideas of beef and dairying qualities. Take no animal as a gift if the gift obliges you to keep that which has no desirable or excellent points. Buy the best tools and take care of them. Buy the best stock and feed and care for it well. Take pride in your Short-horns, your Herfords, your Ayershires, your Jerseys, or your Dutch, and show by dollars and cents their superiority.

Mixed farming requires good stock and good feed for them; specialties may outstrip in some points, may be the advance guard,

but mixed farming is the great army close behind, which follows up every success and supports every advance. The farmer who has his orchard of large and small fruits, who raises vegetables, both cereals and root crops, who grows fine hay and has rich pasturage, who keeps oxen, cows, horses, sheep, hogs, hens, and who has a little surplus of many kinds to market each year, who produces very many kinds of luxuries and necessities on his farm, who is, in fine, a "mixed farmer" and pursues mixed farming—is in my opinion the pattern man for us to follow, rather than he who plays upon one string, and is an expert in one direction only—who is forever harping away at the same old tune and pursuing the treadmill duties of a one-horse business, drives a "one-horse shay," is a man of one idea, and runs one specialty into the ground. Compare the two; pay your money and take your choice.

My object in these remarks has been to call out discussion and elicit thought. I have attempted to present a few salient points, and these in a plain, practical way. My position is boldly taken and pointedly presented, and in closing I recapitulate:

1st. No one crop in Maine is sure enough for a specialty.

2d. Prices of labor will not admit of pursuing a specialty in farming.

3d. Pay more attention to the grass crop.

4th. Do not crop too long after seeding down.

5th. Keep good stock or none.

6th. Mixed farming is the surest and most profitable course to follow.

7th. Anything that upbuilds our noble State receives my hearty support and approval. This is the only specialty I advocate, the only rivalry I hope to see, and the only object this Board seeks to obtain.

Following the paper of Mr. HAWES, was a paper on the

CHANGES IN OUR FARMING.

BY Z. A. GILBERT, MEMBER FROM ANDROSCOGGIN COUNTY.

There is at the present time a feeling of despondency among all classes of farmers. It manifests itself throughout all the Northern States—in the Middle and Western States, as well as in discontented New England. It is heard in the conversation at the street corners, at the public lounging places, and in the discussions at Farmers' Clubs, and at State Farmers' Conventions; and frequently crops out in the correspondence of the agricultural press, both

East and West. Even that prince of the hopeful, who walks and talks on the farm, shows that his faith is wavering just a little when he makes his deacon say: "'I tell you,' says the deacon, 'farmers have worked cheap this year.'" At the West, farmers, discontented with what they are receiving, discuss monopolies, that they may make the East pay more for their meat, wheat and corn; Eastern farmers, discontented from the same cause, discuss monopolies in the vain effort to obtain from the West their meat, wheat and corn, at cheaper rates. All hands agree in one respect—discontent. An epidemic discontent seems to be sweeping over the land, as prevalent as the late epizootic catarrh among horses.

It is claimed that agriculture, particularly in New England, is in a decline; that farms are being abandoned; that the rural population is gradually and surely decreasing; laborers are fleeing from the country to the villages and cities, where they find better pay for their daily labor than they can obtain by working a farm; that farms are decreasing in productive capacity, and that farming generally cannot be made to pay as well as the efforts put forth should warrant.

While we have no sympathy for croakers and grumblers, and would not encourage them in their favorite pastime in any degree, still it must be admitted by every candid, thoughtful observer,—whether laboring for the interests of New England farm life or unwittingly encouraging emigration therefrom,—that some of the aforesaid claims are correct.

That the rural population of the strictly farming towns is gradually decreasing, and that laborers are leaving their farms and congregating in villages and cities, we all know, and it would be interesting to consider at this time the causes for this, but it is not the province of this essay to expand upon this point; it is proposed only to consider the claimed decline of agriculture in our State, and suggest, so far as may be, remedies for the same.

Average farming in the older sections of our State is not being rewarded with so bountiful returns as were formerly realized by the same efforts. The conclusion, therefore, is not far from correct, that farming generally is not paying well. That it is not paying as well as the efforts put forth should warrant cannot be so readily admitted, as will be seen as we proceed. The main idea which prompts the arguments here presented is that *the efforts of the average farmer are not well put forth.*

Years ago, before the natural furtility of our soils was exhausted, crops sprung bountifully from the earth. All that there appeared necessary was to sow in spring time, and in autumn reap bountiful harvests. It was the diligent hand, and that alone, which made its possessor rich. Grass, on which we are now trying to base our agriculture, grew without thought or effort on the part of the farmer, save the seeding, and produced so bountifully as at times to become a burden. Grain and potatoes put to shame the meager crops now realized. Apple trees thrived as well as the forests which surrounded them, and bore fruit as bountifully as the oak its acorns, and as free from noxious insects. Pastures stocked down with the sweetest honeysuckle afforded an abundant supply for the stock on limited areas.

Now all is greatly changed,—and at the present time farmers are not receiving a fair compensation for their daily labor in addition to a satisfactory rate per cent. on the capital invested. Is it unreasonable to ask this? May they not reasonably ask the same per diem that is received by the common unskilled laborer, and in addition thereto receive a rate per cent. on invested capital equal to that realized on other perfectly safe investments? If these things are so, (and no one can question it,) there is certainly a cause for it; and for the purpose of searching out, and if possible ascertaining the cause, let us examine the agriculture of the State, past and present. It is the part of wisdom to examine our true situation and note all its bearings.

In order that there be no misunderstanding in regard to the foregoing premises, let it be borne in mind that the present condition of agriculture is assumed to be general and not universal. Many farmers are to be found who are prosperous—whose farms are productive, and are bringing the owner an income which men in other business would not look upon as insignificant. These, however, are exceptions, and for the present will be passed by. Let also my own position be understood. I am not one of the croakers. I still have faith in farming—still have faith in the soil I cultivate. I have no idea of leaving the farm for some other pursuit, for I fully believe that the remedy for existing evils and discouragements is within our reach, and may be fully overcome. What those remedies are will appear as we go along. Farming is at present somewhat under a cloud, which in due course of time will pass away, but not to leave us in the condition of days gone by. Asking pardon for these personalities we will proceed:

If we should examine the statistics of land productions in Maine as found in the census tables, and compare those of 1850 with 1870, we shall find that the numbers of live stock owned in the State at the two different periods do not essentially differ, save that horses have considerably increased. Corn, wheat and rye, have greatly fallen off. Oats have slightly, and barley considerably increased, but not enough to overcome the loss in the others named. So that of corn and grain we produce some less than in 1850, though the change is not very marked. Potatoes have doubled. Hay has considerably increased, but we keep no more stock. Orchard products have doubled in value, owing largely no doubt to better means of transportation, which enables the owner to realize more money for the same product than in 1850, and also to improved kinds realized by grafting. The products of market gardens have considerably increased. Butter and cheese no more than hold their own.

Now, then, these statistics show two things: First, that our soil is not so productive as formerly, for while we have enlarged the number of acres of improved land by bringing under cultivation many acres of newly cleared lands, we keep no more stock, and purchase to a vastly greater extent than formerly of Western corn and oats to sustain that which we have. And second, the agriculture of to-day in the State of Maine does not differ very essentially in kind from the agriculture of twenty-five years ago, save only that we grow less corn and wheat, sell more potatoes, and that the money value of our apples has largely increased, and we do something more at market gardening. The multiplication and improvement of orchards, and the increase of market gardening, are without question, steps in the right direction. But we learn from the above that the great mass of farmers are still endeavoring to produce just what they produced twenty-five years ago. We are to-day trudging along in the grooves of the Past—keeping the same stock, no more, no less—cultivating the same acres, and growing the same kind of products—crops growing less every year, and the owner of the land losing heart in the business. I say the agriculture of to-day does not essentially differ from that of twenty-five years ago, save only that we harvest less abundant crops from the same old acres. The old fellow whose conscience troubled him for not paying for his newspaper, describes exactly our agriculture, past and present, in the following honest rhyme,

the last verse of which, it will be seen, however, finds no application here:

"I plows, I sows,
I digs, I hoes,
I gets up wood for winter;
I reaps, I mows,
I 'taters grows,
And yet for all I knows,
I'm 'debted to the printer.

I do suppose
All learnin' flows
Right from the printing press;
So off I goes
In these 'ere clothes,
And settles up, I guess."

This we are doing while the *laws of production, demand and supply*, which first shaped this system of farming, have most thoroughly and radically changed. We are blindly at work trying to meet an entirely new order of things with an old order of efforts—with the same efforts used under an entirely different order of things.

The increased demands of cities and manufacturing towns, the opening up of new States, the increased facilities of transportation, the high price of labor and the scarcity of the same, have entirely changed the laws of demand and supply; and yet these changes, great as they have been, have not been sufficient to induce the staid old farmers of Maine to correspondingly change their productions.

This in a great measure is the cause of the present low condition of farming among us. 'Tis not in the soil, 'tis not in location, 'tis not for want of a market, that these things are so. "'Tis not in our stars, but in ourselves." A "new departure" is demanded of us. We must depart from the methods, from the practices, from the productions which were demanded half century ago, and be governed by laws which are now in force—laws which were enacted by conditions over which we have no control, and which will be modified only by demand and supply. To act intelligently we must study those laws and conditions, and shape our course and govern our operations accordingly. Now is a favorable time to take a departure, when we have been reduced by the misfortunes of two years past to so low an extremity that there is little now left to encumber us.

These conclusions will be met by the doubting and faithless with the questions: "Where shall we strike?" "What can be done?" declared with an inflection which indicates the belief that if a departure is made with a view to bettering our condition, it should be a departure to some more desirable locality than can be found in Maine. Maine, they say, cannot compete with the West in fattening beef. We cannot compete with New York in making cheese, nor with Vermont in making butter. We cannot afford to raise corn, because we can buy it cheaper than we can grow it ourselves; nor wheat for the same reason. The apple crop, on which we have placed some dependence, is to be almost worthless, now that Michigan is producing them so abundantly and at so much less cost than we can do it. New York almost ruined the apple market, and now the West will finish it. Massachusetts and Connecticut send us all the onions we want, (if we pay them well for it.) Rochester finds it very convenient to grow our young apple trees for us, therefore we cannot do it in Maine. The far West and California can keep sheep at so cheap a rate that they are no longer of any account here.

It is true, Maine can raise a few potatoes for export, but the Colorado potato bug is soon coming, and then all will be done for in that direction. If all these things are so, then it must be admitted that there is little encouragement for the farmer in Maine. There is only one production left for him to turn his attention to, and that is the production of smart men and women for exportation. But even here there must be a "new departure," or the supply, since the present fashion of small families prevails, will soon run short.

But let us look over the field and see if any good can come out of Nazareth. As before stated, the short crops of the last few years have left us unencumbered with stock or productions of any kind in such abundance as to seriously interfere with any new departures from our old productions, or from our old style farming, which we may see fit to make. We may, as taste or judgment may dictate, start anew in any direction which promises best, encumbered only by old-time practices, by prejudice, or by ignorance. We would not by any means be understood as recommending that farmers should essentially change their stock and their productions with every slight turn in the tide of events—with every rise or depression in the value of their favorite productions. This is one of the worst practices among farmers. But

when, as at the present time, a long series of years have proved that while we should have been gaining in strength we have gradually grown weaker—while past experience and the prospects of the future all prove that we are spending our strength against the tide of events, then it is time that we allow Judgment to search out the favoring currents, and Wisdom to direct us to the haven of success and prosperity.

It seems as if a large majority of the farmers of Maine were *obstinately determined* to pursue just that course which they should not—that course that contributes the least to their prosperity. If as much earnestness and perseverance were manifested in the right direction, our farmers would to-day be a long way in advance of where they now are. Recently light is breaking in upon the darkness in some localities, and it is hoped that it will continue to widen and expand, like the ripple upon the glassy smoothness of the quiet lake, till it shall extend to our utmost borders. It is to assist in a measure in carrying on this work, and in bringing about the results so desirable which will surely follow, that we ask your attention at this time.

It does not necessarily follow, that because some sections of our broad country can produce the list of productions before given at a much cheaper rate than we can do it, that it is the best policy for us to go there and purchase our needed supply, instead of producing it from our own soil. Neither, on the other hand, does it follow that because we need an article we should produce it, though this would be a safer policy, when followed to the letter, than the other. Neither is it true, that because we are not now producing an article consumed by our people, that we *cannot* grow it, and grow it too at a profit. Here is where we must use judgment in making up a decision and in shaping our business. Should we adopt the policy of purchasing of other sections all that can be by them produced at a cheaper rate than we can produce it ourselves, there would be danger of our arriving at a point where the query would arise, "Where is the money coming from?" If we can produce *money* here in Maine easier than we can produce articles of necessity and comfort, then we are all right in buying instead of producing. But here comes a difficulty. We obtain all the money we honestly can in any way not directly connected with farming, and then produce from the soil only that which the money fails to buy. The conclusion would seem to be a just one—and probably not far from correct—that if we only had money

enough to supply our daily wants, we should produce nothing. "Better to buy hay at ten dollars a ton than it is to sell it," said an old farmer, as he was trying to get a crumb of comfort from his necessity, while he was loading a load of hay purchased of a more fortunate neighbor. "May be" said the neighbor, "but sometimes 'tis easier making change when selling," The policy seems to be to buy everything we need as long as we can make the change, and to depend principally upon operations outside of the farm as a means of securing the needful "change." As long as this policy prevails, it is not strange that farming in Maine is not profitable. And add to this the fact that we are continually hunted down by a set of sharpers and swindlers, who, making what is claimed as our necessity their opportunity, are continually flooding us with foreign productions, implements, machines, &c., with which to entice the last possible dollar from too willing dupes, and there is no wonder why the supply of change sometimes seems short. A cool observer, whose head is always "level," made the remark, that "we are the most gullible people on earth." If the thousands of dollars could be counted which are annually paid out at exorbitant prices for "choice" new seeds, trees, plants, books, implements, fertilizers, &c., whose merits are found only in extravagant advertisements and in the harangue of flippant swindlers, the total would reach a figure which would convince any one that here among the farmers of Maine is an inviting field for such operations. Not long since, a rural town, feeling heavily the weight of taxes annually assessed in consequence of the heavy war debt against them, paid over two thousand dollars in one winter to an agent for books, and after the books were received they proved of little value. After these sharks have wrung the last possible copper from the male head of the family for trees, plants, or seeds, the sacred precincts of home are invaded for the little money the good wife may happen to have in her possession, in exchange for roses, gladiolus, pot plants and flower seeds, the most of which proved worthless on account of the severity of our climate, or for lack of skill in cultivating them. Not satisfied when the money is all obtained, the next move is to present models of "valuable" labor saving implements, and in exchange for a promise to deliver, obtain from you a "promise to pay" a hundred dollars or so of money not yet earned. All this money goes out of the State and leaves us just so much the poorer. Better by far depend upon our own State for these productions. It would be equivalent to

creating just so much money and dividing it among our own people. A new departure here would contribute immensely to our prosperity. No one more than myself would encourage the purchase of books, but they should be books of value, and such as you want. So, too, would we cultivate flowers, adorn the premises with shrubbery, set trees, purchase occasionally choice seeds, and improved implements. But we should know whether we are getting the worth of our money,—whether we are getting what we want. We should inform ourselves, and then be guided by our knowledge. It is ignorance many times which makes us the dupes of the artful. Besides, all these productions which would be of value to us can be produced in our own State, if we will manifest the same pluck and energy, and exercise the same skill that is brought to the work in other States, and at the same time not only keep our money at home, but also give employment here to our young men now engaged in the same business ahead. It is time attention was given to these matters by every one who would promote the prosperity of our people. Of *course* farming in Maine will not flourish and the farmers gain in prosperity, as long as the leading specialty adopted by them is paying out money to more enterprising sections.

We have a variety of soils, not as rich perhaps as in some other States, but capable, on account of demand and supply, of producing as valuable returns from a given area as almost any other State. The climatic conditions are not, to say the worst, unfavorable to the production of nearly all our needs. We have only to depart from the old-time practices where new conditions demand it, to reap the harvest we court. And in making this departure, we must first set the mind at work to assist the willing hands. Brain-power moves the world, and brain-power guides the hand which produces abundantly paying crops from the soil. It is not the soil, which in the state of nature was made up of the elements of fertility in the greatest abundance, which produces the greatest returns; it is that where the most mental power is worked into it. It was in earlier days that the diligent hand was the chief power needed; now it is the active, intelligent mind. If proof of this is needed, we have only to look around in localities no more favored by nature than the farms we ourselves own, and see what is being done,—see what returns are received from the best conducted farms, not only in this State, but also in other sections of New England. The fact is we have used the mind in reconnoitring for a chance

to play the winning card in some enterprise disconnected with the farm, while our hands have been left to do the farming alone. It has been required of the hands to earn the living by working the soil, while the mind was engaged in other enterprises. If the mind proved successful in its efforts great care has been taken not to invest the proceeds in the work with which the hands have been engaged. The proceeds must be kept entirely distinct and separate. The one goes to feed the family and pay running expenses, the other is "laid up." If the mind prove the more successful, as it always does, we soon learn to look upon farming as bringing us poor pay. The fact is, the farm is paying us exactly in conformity to the character of efforts put forth. We need not expect to reap that which we do not sow.

We must make our farming a business. To become successful in business pursuits a man must first be schooled in the rudiments, as we have been schooled in farming as an art. He must then have heart in his work, and enter into it with all his mind, might and strength. Just so should the farmer. When the merchant succeeds in making a few hundred dollars, he does not deposit it in the bank and attempt to go on with his trade, cramped and crippled for want of capital,—he invests it in his business, and is thereby enabled to go on with it still more successfully. So should the farmer do. *The farm is the best savings bank,* and will pay a higher rate per cent for such investments than can be obtained at any other place of deposit. Here all surplus funds should be invested, in the full faith that the investment is safe, and that the income will be sure and satisfactory.

The house is to be made tasty and pleasant, and arranged and fitted up for doing the necessary work with ease and despatch. The barn is to be made in the highest degree comfortable for all the domestic animals. Lands are to be drained and otherwise improved. Permanent fences are to be built. Fruit trees must be extensively planted and well cared for. Facilities for saving the manure must be arranged, and labor expended in saving it. Fertilizers must be purchased. Improved implements provided. Improved stock must be purchased. All these investments will pay a liberal percentage on the capital—most of it in money, and the remainder in pleasure, comfort and happiness, but none the less "pay" because it is not in the shape of dollars and cents—and will pay it annually; while the farm, (the bank of deposit,) will annually grow more valuable, and will disburse increasing

dividends as the years pass on. What a contrast between such a farm and one where muscular power alone has been struggling! Poorer by degrees, but surely, has the latter grown, till at last, reduced almost to poverty, the owner sells out in disgust with farming in Maine, moves to the village a day laborer because it pays better, or goes out West where the same process may be repeated, and his land falls into the hands of the owner of the other farm to be held as an out pasture. How frequently is this drama enacted! and in every repetition teaches a lesson which thoughtful farmers well may study.

We must have a clear idea of what we are aiming to do, and must have a definite plan of operations mapped out by which to secure the object aimed at. There is said to be much aimless preaching in the world, but there is far more aimless farming. Supposing the questions should be asked, "What are you proposing to do on your farm?" "In what direction are you proposing to obtain your income?" Wouldn't the questions be "posers" to three-fourths of our farmers? The fact is, there are no plans ahead, and where that is the case the prospect ahead is not very promising. We farm it as though this year was our last on earth, and we scrabble together all we can get hold of, as though we, like the poor Indian, expected to take it with us to the bright hereafter.

Now, we must depart from all listless, thoughtless, aimless ways, or poverty will compel us to depart for the town poor farm, or will drive us to work for other men who themselves know what they are trying to do. Abijah Wilkerson says, "When a man isn't quite sure what course in life he ought to follow and means to keep up that way of thinking, I advise him to go into politics; he'll find lots of company, if he finds nothing else." We need to take into consideration what we wish to do, what our farm is best adapted for, what the wants of the nearest market demand, and everything else which will have an influence upon the success of our operations; and when a decision is reached as to what kind of farming to pursue, then we have an object in the mind, and must shape—and we shall shape—all our operations in that direction, and we must put forth all our energies to make it successful. Such farming will be successful.

All the income from farming comes a little at a time, and all these "littles" must be watched with the same untiring interest that we would give to larger enterprises. Nothing must be done

unless it is looked after and made to pay. George E. Waring writes to the Department of Agriculture of a farm of twenty-six acres in the vicinity of Newport, on which twenty-five cows have been kept. The feed purchased was only equivalent to the keeping of the teams. The income from the farm in 1870 amounted to an average per acre of $144.55. The prices received for the products were not far in excess of what a smart man would here obtain for the same. Mr. Waring says these results are not due to what are known as "modern improvements;" that "there is nothing done here that is not done on any good farm in New England; but everything is done with a will, and industry, perseverance and thoroughness, characterize every part of the work. The cultivation is thorough and cleanly, the use of manure excessive, the feeding high, the marketing skillful, and the economy in every department complete."

"But," says a lean, hungry, farmer, whose acres are as hungry as his cattle, and whose children are as uncared for as his other possessions, "What has that to do with farming in Maine? no man can do it here, or anything like it." Now, then, there are these reasons, *and only these*, why it cannot be done in Maine, as well as in any other of the New England States—*ignorance, indifference* and *pointless effort;* ignorance in relation to the capabilities of our soils and to the means of rendering them productive,—indifference as to whether they are productive or not,—and lack of force because we know not where we are striking. The same means used to make that farm so productive, not only of farm products but of dollars and cents, applied here, will make our farms equally productive of the same necessary commodities.

If the present drift of opinion in relation to the productive capacity of the State be true,—if the complaints of the croakers and the shadowy representatives of the discouraged and disheartened represent the true standing of agriculture among us,—in short, if Maine can buy all agricultural productions at a cheaper rate than she can produce them, then the fact should be accepted, and these fair fields and infertile soils should be at once abandoned. But I am unwilling to accept this as the case. I cannot bring myself to believe that all Maine is good for is to produce spruce timber and consume the products of her sister States.

But *farming here must be essentially modified or the farmers cannot prosper*. The down grade on which we are now moving will carry us with increased velocity as we gain momentum with time

and distance, bearing us surely and more swiftly down to sterility and poverty, unless we "down brakes" at once, and reverse the motive power. Let us then, briefly, scan the field, and see where further departures from old-time practices are needed.

We must, to a large extent, turn our attention to supplying our own wants in addition to the great staples grown to be sold out of the State. This may at first thought appear to be a confusion of ideas, where the premises have been so strongly taken that a change from our old-time productions is necessary, and the fact occurs to the mind that before the advent of steamboats and railroads our farming was necessarily confined principally to the supplying of the wants of the inhabitants. On consideration there will be found no contradiction, for with the advent of cheap and rapid transportation,—with the introduction of manufactures and an increase of population, bringing with them higher wages and more plentiful supplies of money, have come a multitude of new wants. These wants many argue, and practice is following the trail of the arguments, can better be supplied by purchase from abroad than by production. This is the idea confuted. And first, to the extent of the demand, our attention should be directed to those productions which come least into competition with other more favored locations.

The field is broad enough to suit all conditions, and the demand sufficient to call forth all the energy we are at present able to put into the field. "But the West"—I know it. But the competition between the West and New England is not, or need not, be so sharp as is claimed. There is nothing fearful about it. The highest skill of which we are capable, concentrated upon our small fields, will almost annihilate competition with Western products. Where we concentrate great efforts on a small territory, the great outlay enables us to grow those nicer products which return a large income from a small area, and which cannot be produced in the West and forwarded here. We must then refine our farming—make the land richer, cleaner, and more productive. Western farming for many years to come will be careless, superficial and wasteful, in just the proportion of its extensiveness. Unaided nature cannot compete with genuine agriculture conducted by the highest New England intelligence, no more than can the panniered donkey of the East compete with the locomotive engine in the transportation of freights.

Not long since, a worthy ex-President of this Board, hailing from this good old county of Kennebec, (I love still to do him honor for the noble work of elevating the standard of practical agriculture to which he formerly so faithfully devoted himself—I say, I love still to do him honor, however much he may have recently "fallen from grace,") made use of the following language while speaking before a farmers' club, and after he said it pronounced it "good," and published it to the world of farmers in Maine: "There are too many people farming. Let our young men learn a trade and they are independent; let them get a farm and for the rest of their lives they are poor, even if they have their farms given them. Go to Augusta or to Lewiston and work in the mills, or to Hallowell and work in the quarry, or to Massachusetts and work in the machine shop, or anywhere else where honest labor will pay, but let farming alone till it will pay a fair price for intelligent labor. Don't buy a farm, and don't let anybody die and leave you one, if you can help it."

Mr. PRESIDENT. Too many people farming in Maine, where we do not grow one-half enough to supply the wants of our own people? Too many people farming, where seventh-eighths of our inhabitants must send to Minnesota for the bread to place upon their tables? Too many people farming, when we purchase corn from Illinois by the million bushels to supply our own needs? Too many people farming, when we do not now supply our own neighbors with butter and cheese? Abandon these rocky highlands, when ships lie at our wharves ready to transport the fruits of our orchards which no other section can produce in such perfection, and which we are too faithless to grow? Abandon these luxuriant meadows and green hillsides, and send to Texas for our beef, while a neighbor can sell a single pair of oxen for five hundred dollars? Not buy a farm, when our Boutelles, our Ogden Farms, Walcotts and Campbells, Morgans and Whitmans, are selling their Jerseys, Ayrshires and Shorthorns, for five hundred, one thousand, two thousand, and even five thousand dollars for a single animal? Not take the gift of fertile acres, when the members of this Board must this day eat their roast turkey without relishes, unless our good landlord draws upon Westport for onions, Concord for cabbage, Arlington for cauliflower and celery, and Boston for pickles? Not worth the having, when hundreds of thousands of dollars are annually paid to New Yorkers, at the rate of five cents apiece for fruit trees, and to agents at the rate

of thirty more for teasing us to buy them? Leave our own native State with all these wants unsupplied, under the delusion that our labor is not here needed? No! Let us rather show to our young men that *here* are wants to be supplied; that *here* are resources undeveloped; that *here* is a sure and sufficient reward for all who work wisely and well. No! not too many farmers! Let us, then, instead of trying to frighten our brethren from their farms, labor to make them better farmers. We want, not *less* farmers, but *better* farmers.

When we look over the agriculture of the State at the present time, we find signs of progress cropping out here and there in the form of new enterprises, which correspond in a measure to the changes which we have alluded to. Such indications of progress are encouraging to every one interested in the prosperity of the State at large, and particularly so to this Board, which recognizes in these developments the fruits of the earnest labor which it has long been performing. Still there is room for much more progress, not only in introducing new productions and new practices corresponding to the demands and conditions of the times, but also in modifying old practices which from the same cause should now be abandoned.

The system of associated cheese making is fairly established among us. All that is necessary now is to give it our "God speed." It is sure to become popular here as everywhere else where it has been introduced. While this associated effort is engaged in the production of cheese, the more important butter product should not be overlooked. The President of the State Society told us last fall, in language more poetical than wise, that "butter has been stricken from the productions of Maine by the increased facilities of transportation." We have ever considered the Honorable President good authority on rural economy, but that statement—well, I simply don't believe it. And I do not believe these gentlemen here before me, owners of those beautiful Jersey cows found in this vicinity in so large numbers, will accept the statement as true, as long as they find a ready market for their golden product—golden in more than one sense—wherever its quality is known, whether it be at home or in distant States.

That other States, some of them at least no more favored by nature with soil and climate than are extensive sections of Maine, with lands having double and even quadruple the value of ours, can prosper in making butter and cheese and transporting it to

our doors, to be by us paid for and consumed, is proof positive that we shall find it a profitable business to supply this same demand from our own farms; provided always, that we possess and exercise knowledge and skill in its production equal to theirs. Dairy lands here are cheap. No one who chances to eat at the table of one of these Winthrop Jersey fanciers, will question but as good an article can be made here as can be made elsewhere; and, to say the least, we can receive for it all that other sections receive at home and the cost of transportation added,—yes, we can receive more, for there always is a premium on a good fresh article direct from the hands of the producer. We shall thus find it profitable, instead of allowing the cows to decrease in numbers as they have, to largely increase them, till at least the home trade is supplied with butter and cheese made in our own State.

Market garden products have largely increased in this State during the two last decades, and may be still increased to a great extent. In fact, many of our farmers may look to these and similar products for a solution to the question, "How to make the farm pay."

Can any one frame a reason why we do not raise our onions, instead of purchasing them abroad? Owners of land in Massachusetts find it a money making business to grow onions on land worth five hundred to a thousand dollars an acre, the soil of which is far inferior in productive capacity to ours, with help costing more than it costs among us, and transport them down to Maine to supply the owners of these cheap lands with this highly prized vegetable; yet it is proved beyond a question that onions can be grown here as well as in Massachusetts. All that is needed is Massachusetts skill worked into Maine soil,—refining our rough potato culture, and changing it to the smaller limits, nicer work and more nursing of the onion bed. With skill, forethought, and that unremitting attention which insures success in any undertaking, the onion is as sure to bring its returns as is the potato. We should then not only supply our own wants, but also contribute largely to the demand in the large markets of New England. The town of Westport, Mass., grows annually three to four hundred thousand bushels. The average yield per acre is put down at five hundred bushels; and the greatest yield one thousand bushels from a single acre. I have in my pocket a certificate, signed by two reliable men, certifying that they pulled and weighed a crop of onions grown upon one-fourth of an acre in

Androscoggin county, and found the same to be 392 bushels—52 lbs. to the bushel—or at the rate of 1,568 bushels to the acre. "I tell you," says the enthusiastic grower, "in order to make our farming pay, we must reduce the fields and enlarge the onion bed." Figuratively applied, the expression is a significant one.

There are still other new enterprises, which have been pursued among us to an extent sufficient to prove their profit, but not to an extent to attract attention from farmers generally. We are annually paying a hundred and fifty thousand dollars to Boston pickle dealers for the one article of pickles. Lewiston and Auburn alone purchase 1,000 bbls. of cucumber pickles, exclusive of those put up in jars, at an average price of $14.00 per bbl. These are all grown and put up in the county, and probably no other city in the State can boast of a supply of home made pickles. Few people are aware of the extent of this pickle trade among us. Those who are engaged in growing the cucumbers and putting up the pickles find the business profitable. An average crop is 100 bbls. to the acre, worth in the grower's hands five dollars per bbl. All the pickles consumed in Maine should be grown here, and the large amount of money now sent to Boston should be distributed among our own farmers.

Another source of profit, and one which should be looked after to a greater extent by our enterprising men, if we have any, is the growing of nursery stock. We are annually paying out immense sums for foreign fruit trees, vines and shrubbery, under the prevailing idea that it is one of the taxes to which we are subjected by the unfavorable conditions of soil and climate, which characterize our State. New York can grow them at less cost than we can do it; but we can grow them, and make a handsome profit at the business, at the price which is here paid for them by the purchaser. Good nursery stock can be grown in Maine. If fruit trees will ever make healthy growth here, they will do it while in the nursery. All the trees and vines wanted here should be here grown; then would the large sums of money now sent out to enrich other more enterprising sections be retained here.

Gentlemen, more than my allotted time has passed, and yet I have hardly entered upon this fruitful subject. There are many productions not yet alluded to which our farmers would find it profitable to grow, and which are now almost entirely overlooked, and still others, faith in the production of which is waning, which should not yet be dropped. I proposed to speak of the growing

of small fruits, and would be glad to refer to the production of fat sheep and of early lambs, and to the fattening of beef as a source of profit, but I am reminded that you will need to resort to the latter as a source of nourishment before I get through, unless I stop right here. Permit me, however, still to say that what we first need is faith in our business—faith in the soil of our own State. We need also, let me repeat, to turn our attention largely to supplying the wants of our own people. We must not waste our resources on poor lands, but confine our operations to good lands, and study not to misdirect their capabilities. We must work less land and do it better—keep less stock and feed it better—grow less weeds and get better crops, and then shall we realize greater profits and pocket more money, when all our *real* wants can be supplied, but many of our imaginary ones never.

At the conclusion of this paper, Mr. GILBERT said:

I wish to add one word, and that is, that I want you all to bear in mind that this is a public meeting at the present time,—a public farmers' convention, and not a meeting of the Board of Agriculture. The private meeting of the Board of Agriculture closed at ten o'clock this morning; this is a public farmers' convention, where all have equal rights and all are invited to exercise them. It is expected of this assembly here, that they will take part in these meetings, in fact, conduct them, practically. We propose, from time to time, to furnish you, if possible, some ideas to work upon, and perhaps hang out some pegs for you to scratch against. I have endeavored to do so in what I have read; and now please do me the favor, not to criticise the language used, but if what I have said has awakened any thought in your minds, give expression to it. This subject has been before the people of the State since the session last fall, and there has been, as yet, no expression from them upon the subject. There has been no discussion; but I hope that you will now take up the subject (and I believe I express the wish of the members of the Board), and handle it without gloves; discuss it freely, discuss it fully, and let us know whether the leading farmers of the State, here assembled, have any idea that any change in our practices is demanded by the times.

MR. COLBURN of Kennebec. While I heartily endorse the paper of Mr. Gilbert, in the main, there are some things to which I should take exception. In the commencement of his paper he touched on the article of butter, and, as I understood it, (perhaps I misunderstood him), said we could not compete with Vermont in the article

of butter. Now, I should hardly dare to come up here to this seat of the Jerseys, and make that remark to the ladies of Winthrop.

Mr. GILBERT. I dislike to interrupt, but I want to correct the gentleman, if he will allow me. I was quoting the croakers then.

Mr. COLBURN. I saw afterwards that he modified the matter very much. But it has been said that Maine cannot produce butter to compete with the butter-makers of Vermont. I would inquire what has been the price of a good article for the past ten years, in Portland, Bath, Augusta, or Bangor? Has it not been from 35 to 50 cents a pound? Is there any butter brought from Vermont that brings that price? If so, I have never known it.

While referring to exporting and selling our farm products, I think the gentleman mentioned the selling of hay. The selling of hay,—one-horse farming,—has brought the common farmers of Maine just where they are. Our fathers before us used to keep a span of horses and a yoke or two of cattle; they could do all their plowing and everything as it should be done, and they got good crops in return. They had an advantage, I know, in having a virgin soil, but still, I think the fact that we do not get better crops is to be attributed, in a good degree, to the method which is followed by many of the farmers of this State. We do not plow deep enough; we do not pulverize the soil as it should be pulverized after plowing. Then go to the farms where they are selling their hay, and see what they have left. There was a certain man who went on to a very poor farm this side the Penobscot river, and in a very few years he was getting large crops of hay, while his neighbors were getting very small crops. He was asked the cause of it. He said, "you may go back a little ways from where I live, and when you see a horse in a barnyard going round in this way, it accounts for the condition of things." What he meant was, that they pressed their hay, hauled it off the farm and sold it, and had nothing to raise a crop from. There is where the great difficulty in many sections of our State arises. The farmer sells everything he can, and does not keep enough to maintain the fertility of the soil. I insist upon it that, so far as my observation has gone, a man cannot farm it successfully anywhere in the State of Maine that I have ever been acquainted with, if he follows the practice of selling his hay. Keep your hay, no matter if you do not have so many dollars in your pocket, and use it on your farm, and you will have no occasion to cry out, "Short crops!" "Poor returns!" etc.

After all, there is not so much difference in the crops as there is

in the condition of the common farm to-day and fifty years ago. Fifty, and even twenty-five years ago, almost every farmer would have from two to six cows, to make butter and cheese, and he had to use the products of his farm to keep those cows. The housewife was willing to make the butter and cheese and sell it, and, under this method, the fertility of the farm was kept up, so that it would produce good crops. But lately the farmers have got a little independent, (a good many thought they were independent when they were not so), and they have sold out their dairies,—the women did not want to work so hard making butter and cheese,—and gone to selling their hay. Consequently, they are getting less and less returns from their farms, and they are growing poorer and poorer every year. Now, in taking a new departure, let it be from the present state of farming back to the old method of farming. Raise what you need in your family, and use it. Do not go into extravagances. Do not follow the fashions. Farmers are not rich; they are generally poor; that is, they cannot compete with those who have a great deal of money, and have all the necessities and superfluities in the world. We cannot make that flourish and show that rich men can. Our forefathers were willing to live on what they could raise on their farms, but there seems to be a disposition in these days not to put up with what we can raise on our farms. It is just there that the trouble arises. We are not willing to live within our means; we want to go beyond our means. If the farmers of Maine will all come down and live as our fathers lived, and not look after the superfluities of life any more than they did, we can live just as independently as they did. The time is coming when we have got to do it, and we have got to bear the blame of it.

Mr. ATHERTON of Hallowell. I cannot agree with the last speaker that we should live as our fathers lived. Times have changed since their day. The question for us to consider is, what have been the changes during the past twenty years, and has the system of farming been changed so as to meet those changes. Great changes have undoubtedly occurred within twenty years. Railroads have been established in every part of the country, and we farmers have helped to build these railroads and elevators, and we have helped these city men to get rich out of them. They are taxing the farmers heavily by putting on high freights, and they are getting rich out of it. That is the fact. We are helping these city men to build fine houses and furnish them luxuriously, and live in great

style, as many of them do. We are taxed heavily, in many ways. We pay very large amounts to the railroads and to middle-men. I do not know what will be the result, unless we seek redress through the Legislature, and have some means by which transportation shall be put down to such rates that we can ourselves make the profit.

Then, again, these railroads, reaching in all directions, have brought the city and country nearer together, and consequently, city fashions have found their way into the country. Our wives and daughters, when they go into the city, and see how city people live, want to live better, and have better food and clothing,—naturally so. We cannot, therefore, live as our fathers did; we want to live a little better. All this costs money, and it comes a great deal harder to pay.

Again, the war placed a terrible burden upon us. Farmers who before were paying a tax of $100, now pay $200. During the war we were all busy raising infantry for the army. Now, perhaps we have forgotten all about it; we are raising no infantry now. There are not so many large families as there used to be, and what there are want to go off to the city; consequently, many of the farms are left without any of the sons and daughters to take hold and help the old folks, as they used to do. All these things combine to depress farming. And during these past few years we have given our attention to this thing and that thing, and run into this, that and the other. When sheep raising was popular how the farmers rushed into that; and when it went down they all got discouraged and went out of it. We are all Yankees, and we try this thing, that thing, and everything. But it seems to me we should take up some one thing and make a specialty of it. For instance, hay. Let those farmers who are so situated that they can raise hay to the best advantage and put it into market and get a good price for it, follow raising hay;—not exclusively; raise a little corn and potatoes, but make that the specialty. So with fruit. If we have natural advantages for orcharding, if the soil and climate and everything else is favorable, let us give our energies to the raising of fruit. So with sheep, and the making of milk and butter. And here let me say, that we can make just as good butter in the State of Maine as anywhere. Perhaps you have seen the statement of Geo. E. Waring, in the "American Agriculturist," in regard to butter. He gets from 75 cents to a dollar a pound for his butter, and I know there are parties who are getting

from $1.00 to $1.25 a pound for their butter. That is a great price, brother farmers, to get for butter, and how do they do it? They have the best stock to make it from; they feed that stock very high, and then they make the butter on scientific principles entirely, in the very best manner that it can possibly be made. It has been made in a very nice manner in this State, but it will not bring such prices. So there is a great deal to be learned in making butter, if one is going into the business.

Mr. SHEPARD of Belfast. I wish to throw out some suggestions which perhaps may do others some good.

The great want with us is manure. If we had plenty of manure, rightly applied, could we not raise things here just as well as in the West or any other section of the country? Is not the difficulty right there, and no where else? Let us study to get manure, and apply that manure to the crop which is best adapted to the farm. If I am on a farm that will produce hay, let me apply that manure to the raising of hay. When I have got my hay, what shall I do with it? Shall I feed that hay to stock, consume it on the place, and return it back to the farm again, or shall I sell that hay, and put the money into manure, either in the form of stable manure or patent manures, and put it on the farm.

Again, if you are situated on a farm near a market, where you can grow garden truck, make that your specialty.

In the paper which we have just heard read, there was a suggestion about raising very large crops from a small piece of land, and another speaker has suggested that there is such a thing as making butter that will bring a dollar a pound. Now, I cannot get a dollar a pound for my butter; I cannot raise such great crops on my farm—why? I have not got the manure to do it with, or else I do not apply the manure right, or the woman who takes care of the milk has not got the facility for making such nice butter. Or is it more from the reputation that it comes from Mr. Waring, than the actual quality of the butter? I think many times these great prices that are got for things are not so much because of the excellence of the article, but because of the name of the manufacturer. Now, who is this Mr. Waring? Was he a poor boy, who started from nothing, and succeeded in obtaining this superior butter from his own resources? Or did he have capital to start with, so that he was able to get those fine Jerseys and all this nice machinery, and hire high-priced labor, and thus make his butter?

Mr. COLBURN. When I was at the meeting in Skowhegan, I received a copy of the Connecticut Report, from our Secretary, and I saw in a paper on Associated Dairying, a description of this very nice "gilt-edged butter" that our friend tells us about—what it cost and what it brought. The writer of the paper said he was taken by the gentleman who made the butter on to his farm, (it was in New York State), and he showed him his fixtures, and all the arrangements connected with the making of butter, and then he told him he got from a dollar to a dollar and a half a pound for that butter. He said he did not doubt it, it was very nice butter; but he said that, as near as he could estimate the cost of the fixtures and everything he had provided in connection with the manufacture of his butter, every pound that he made cost him at least five dollars. If that is dairying to advantage, then we should dairy so. But I tell you, brother farmers, we are poor; we have no resources to fall back upon. When I undertake to do anything in farming, the first question with me is: Am I going to get my pay out of it?—am I going to keep up the fertility of my soil and get my pay for it? If I do not look out for that, what will become of my farm? A man with a hundred thousand dollars may go out into New York State and get a reputation for making this "gilt-edged butter;" I do not care anything about that. The point we are here to discuss is, how are we to maintain our children?—how are we to prevent their leaving us?—how are we to pay our debts? How many farmers in this old town of Winthrop have gone on, paid every dollar, educated their children, and are now rich men? You will see many men here who have done that thing. If they have not made this "gilt-edged butter" that the New York man makes, they have made just as good butter, and better, in my opinion, than the butter which passes through so many processes. It is not the process that makes good butter, after all. We are discussing this question in a practical point of view; not what a man does in New York, with millions of money, but what he does in Winthrop, or Readfield, or Monmouth. I believe that there is a great deal of butter made in Readfield and Monmouth that would eclipse this "gilt-edged butter," when a man sat down to eat it on his bread.

Mr. ROBBINS of Winthrop. We farmers and dairymen of Winthrop, it has been said, are getting rich, or have got rich, by farming. I want just to bring one or two facts, in my immediate neighborhood, to your notice. I was just thinking of five of my

neighbors, going east from my place,—small farmers, who are engaged in mixed husbandry, including dairying. They keep from four to six cows, and do all their work with a very little hired help. Those men have, I think, the past year, sold butter to the amount of half a ton, on the average, to each family, chiefly in Augusta and in this town. That, I think, is the average product of the dairies of five of my neighbors. I suppose that butter has averaged them 38 cents a pound. And I know another farmer who furnishes butter for a Massachusetts salesman, to go into Boston to be sold, at 45 cents a pound. I was in conversation with him within a month, and he told me that he received from parties in Massachusetts, who knew his butter, 45 cents a pound.

In the interesting essay by Mr. Gilbert, I was glad to listen to the statement that some one was said to have made, that we, as farmers, are the most gullible people on earth. My acquaintance with farmers generally leads me to think that that is true. I refer more especially to the many patents which are circulated through the country which farmers are induced to buy. What a vast amount of money has been taken from the farmers of this State for patent rights! I notice that there is, in some sections of the State, a secret organization called "The Patrons of Husbandry," and I have thought, in view of the many ways in which we farmers have been gulled, that such an organization was a necessity. There were many points in the essay which interested me very much, and this among the many.

On motion of Mr. HAWES, the meeting adjourned to two o'clock.

AFTERNOON SESSION.

In consequence of the business for the first day of the session having been defined by the programme, and of the small attendance at the forenoon session of the second day, the proper introductory exercises were postponed until this afternoon. They consisted of an address of welcome by Hon. John May, responded to by Rev. Dr. Allen, President of the State College.

Address of Welcome.

BY HON. JOHN MAY OF WINTHROP.

Mr. President and Gentlemen:

In behalf of the Kennebec Agricultural Society, and our goodly old town of Winthrop, which has already celebrated its centennial and entered on its second year of its second century, we sincerely and cordially welcome you amongst us. Could you have appointed your session here in a more clement season of the year, we would have been glad to have shown to you the outlines of this ancient town, which was settled by our fathers in 1765—its beautiful lakes under the aboriginal names of Cobbossee Contee, Maronocook and Annabescook; its Monk hill and Pisgah and Monadnock mountains. "Our fathers worshipped in this mountain; and ye say that in Jerusalem is the place where men ought to worship."

We need make no extended allusion to this venerable old county of Kennebec, which was once a part of Lincoln; its history is familiar to you all. Suffice it to say that it is the southern central part of Maine, and contains an area of about one thousand square miles, and an aggregate area of about 500,000 acres.

You will pardon us for what may possibly seem to you at first view a needless mention of this little town of Winthrop. We think its history is closely blended in an agricultural point of view with the history and existence of the various agricultural societies in this State. We are told by our fathers, who were the pioneers of this locality, long known as Pond Town, that more than three-quarters of a century since, that meetings were held and an association formed to elevate the laborer and the calling of the husbandman. We are told that the young men of those days began to look upon farming as rather a low employment—their aspirations were for something higher—forgetting that this was the original employment of man, and that all other occupations

are sustained by it, they held that the position of a farmer was not very honorable, albeit Holy Writ said to them, "The profit of the earth is for all; the king himself is served by the field." Unfortunately we have no record preserved of the discussions and doings of that ancient association. The results were so satisfactory and gave such promise of success, that the members were induced to apply for an act of incorporation, which was granted by the Legislature of Massachusetts, February 21, 1818. Alexander Belcher, Peleg Benson, David Foster, Charles Harris, Dean Howard, Nathan Howard, Joseph Metcalf, Issachar Snell, Joseph Tinkham, Enoch Wood, Elijah Wood and Samuel Wood, were the corporators. The first meeting held under the act of incorporation was July 4th, 1818. Its officers were, Samuel Wood, President; Nehemiah Pierce, Vice President; Joseph Metcalf, Corresponding Secretary; Alexander Belcher, Treasurer; David Thurston, Peleg Benson, Issachar Snell, Joseph Norris and David Foster, Trustees. This society was successfully kept in existence some fourteen years. No public cattle shows and fairs were held under its organization; and to enlarge its usefulness the name was changed from Winthrop to Kennebec Agricultural Society, and in March, 1832, the Kennebec Society was formed, under an act granted by the Legislature of Maine, with Samuel Wood for its President; G. W. Stanley, Vice President; Elijah Wood and S. Benjamin, Secretaries; Samuel Chandler, Treasurer; William C. Fuller, Collector; Samuel P. Benson, Elijah Wood and Nathan Foster, Trustees. It is with pleasure that we look back upon these honored names and the efforts of this society, and witness the improvements in the arts of husbandry. The practical and valuable information obtained and disseminated gave great celebrity to the farmers of Winthrop. Nearly all of the first and most active members—the Woods, the Howards, the Vaughns and the Pierces, and last, though not least, our ever to be lamented Doctor Holmes, have ripened for the harvest, and been gathered to the great storehouse beyond these earthly fields, whilst a few remain, here and there one, bleached with the frosts of many winters, now standing like an oasis in the desert witnessing the fruits of their honored lives.

I feel that in this place I should fail of duty without further allusion to the poor man's friend, Dr. Ezekiel Holmes, who lived, worked and died among us, and whose monument stands in yonder cemetery. At his death we felt that not only a great but a good

man had fallen. His friends wept, the whole town mourned, and the State met with an irreparable loss. He had a wide-spread reputation, a kind heart, a clear head, and a generous mind. He was an advocate for humanity, his delight was to do others good, even at the expense of his own welfare. His superior in the arts and sciences was not among us. He was honored with, and honored the halls of legislation, professorships of our institutions of learning and offices of State. Truly we can say that his works do follow him. His brain fairly wore his feeble body out, and he dropped from the tree "like mellow fruit that ripened long, even wondered at because it fell no sooner."

Mr. President, you will pardon us for being so minute in the history of the organization of our society, and we hope you will not deem it arrogance when we claim to be the pioneer county and town in forwarding the great work of agricultural pursuits. Winthrop was the first town in New England, and second in North America, to form an agricultural society—somewhere about 1787. It is no trivial honor to enjoy the merit of being the parental stock from which the several societies here represented by your honorable Board indirectly sprang. What an amount of improvement and usefulness is, and may be rendered to the toiling thousands of our State and nation by the practical knowledge and wisdom disseminated by these numerous organizations and Boards of Agriculture. We think it eminently fitting that you have appointed your annual session here, that *we* may enjoy the fruits which have sprung from our own planting, and also listen to the treatise and discussions before the Board on the important subjects of agriculture and the arts. As citizens, we thank you for the honor conferred, and will endeavor to render in return some slight equivalent, by making your session as agreeable as possible.

Gentlemen, I trust that I am not vain enough to think of enlightening this Board in the brief remarks I may offer on the subject of labor and industrial pursuits, and therefore wish you to consider me as speaking *with* instead of *to* you.

No argument is necessary to prove that labor is honorable,—is conducive to health and morality. Idleness brings poverty and disgrace upon mankind. In the country the number of idlers is few compared with our cities and large villages. If a man wishes to be respected, he must be found either in the workshop or field, or exercising some useful profession. The scriptural adage is, "in the sweat of his face is he to eat his bread." We learn from

the Sacred Book that Adam was a gardener, Abel a keeper of sheep, Noah a ship carpenter, Jacob a shepherd, the Israelites were brickmakers in Egypt, Boaz was a husbandman, Peter and Andrew, John and James, were fishermen, Paul was a tent maker, and the Savior of men was a carpenter.

The Jewish custom was, both among the wealthy and poorer classes, to teach their sons some trade, and their proverb was that if a father did not teach his son a mechanical occupation, he taught him to steal. If the fathers of the present day would imitate their example their wrinkled cheeks would not so often blush for the criminal conduct of their offspring. I partially endorse the ancient command, "Ye who love farming teach your sons to love it too," for it presents fewer inducements to temptation than any other employment, serves to close the door to intemperance, draws them away from the crowded streets and the company of idlers and vagabonds, and gives them healthy and delightful exercise, away from the seductive arts of the vicious. Then again, it is said "Every trade has it cheat and between buying and selling there sticketh iniquity." The raising and vending farm products give no great chance for deception, so that the farmer naturally forms a character for honesty and fair dealing. In these times of gigantic frauds practiced by bank and railroad officers and their legitimate offspring, the smaller crop of swindlers, he rests secure in his own domicil and under his own vine and fig tree, free from mortgages, judgments and executions, away from banks and sharks and brokers, where the rise and fall of provisions give him no night dreams of terror. His own broad acres and industry supply his wants, and his flocks and woodlands provide him with comfort when the blasts of winter approach.

It is a self-evident fact that the best interests of any country are closely blended with the healthy state of its agriculture. Rural scenes tend to make persons happy and contented, more so than spacious halls and gilded equipage. What is more entertaining than fields and groves, and brooks and water-falls—beasts and birds, the open sky and the starry heavens? Then, again, agriculture not only furnishes wealth and independence to our country, but able and willing hands to defend it. If a man can say This is my domicil; This is my farm; This is my abiding place; these fields and pastures show the labor of my own hands; This

orchard and these shade trees, I planted,—with what pride will his heart swell, and how ready will he be at the bugle call to shoulder his musket against the invaders of his country.

One great trouble with the most of us is that we lack system in the cultivation of our farms. In many places the farms are becoming exhausted and are too poor to produce anything like a decent crop, and in the absence of manure we must manage systematically, especially if we expect a surplus to grow rich upon. Every substance in growing takes something from the earth and consequently renders it the poorer and when the same moulders back to dust seems partially to restore it. How far art may go in improvement is yet undetermined. Systematic agriculture consists in drawing less from the soil than is added to it and at the same time giving us a greater profit for our labor. But too many farmers like to travel in the old ruts, believing that the only way to success, and hence we have all kinds of farmers;—there is the miserably poor farmer with his hide bound pockets, who has neither house or barn or even a pigsty worthy of a name—no fences, and we might as well say, no farm, uses a club for a goad-stick and an axe for a hammer, has a disconsolate wife and a group of tattered children, a bottle of rum and a kennel of dogs for his companions, all is sunk in ruin around him. Then we have the middling farmer who contents himself to plod along in the good old way of his father, neither adding to nor diminishing from the old homestead, plows and plants the same fields, turns his herds into the same pasture, carries his grists in the same way to mill, never buys any *new fangled tools*, makes but little or no improvements, congratulates himself for his wisdom and dies just even with the world. Then we have the independent and systematic farmer, always ready to give and receive instruction, prepares his grounds well, sows them early, encloses them with stone walls, gathers his grain when ripe and threshes before it is destroyed by the rats, and sells when the market is most favorable; cuts his grass in season and proportions his stock to his fodder,—in short has a place for everything and everything in its place. His dwelling is neat and tidy and his barn replete with fullness, he has money and enterprise, and lives in thrift and sunshine. There is still another kind of farmer, a sort of Shylock, or twelve per cent. farmer, who make his usury improve his farm and add to his acres, he may have sprung from the independent farmer for he likens him in some respects, has splendid buildings,

fine cattle, noble horses, and luxuriant crops, sends his sons to college and daughters to boarding schools; he is not the worst of men, for he plants his dollars on the farm, and the community sooner or later reap the products; whilst his good deeds are commended his Jewish propensities are ignored.

It has been well said that if the labors of the husbandman should cease, starvation and death would stare us in the face. The muscles of the mechanic's arm would grow flabby; the farmer, the mason, the carpenter and the architect, would die of inactivity. No fee could tempt the lawyer's tongue. The eloquence of the pulpit would cease, and music and poesy would return to their native heaven.

Let me not detain you from your labors. No dissertation from my pen can be of much profit to you, or, I fear, much credit to myself. I will simply reiterate, that industry and labor conduce to happiness; without them idleness and misery surely follow. The great idea is action. "*The world requires action.* The sun is turning on his axis, the stars are moving in their courses, the earth is revolving in its orbit, winds blow, rivers run, oceans roll, birds are on the wing, cattle rove round a thousand hills, man goeth forth to his labor, angels are ascending and descending between heaven and earth." And here the sacred bard lifts up his lay—

> "Not only man but nature lives by toil,
> Beast, bird, the elements and rolling worlds
> Exist by action; nothing lies at rest,
> Save sluggards, death and ruin. Man is born
> To care, and toil must nurture him or else
> His powers and faculties will never ripen,—
> We owe to toil whatever raises man
> Above the wildest quadruped that roams
> The wilderness. Corn, wine, and oil,
> The cottage and the dame, the joys of life,
> Are fruits of industry."

Once more, gentlemen, in the name of the citizens of Winthrop, I bid you a hearty welcome.

By invitation of the Chairman, President ALLEN responded to the address, as follows:

Honorable Sir, and you, Gentlemen of Winthrop:

Permit me, in behalf of the Board of Agriculture, to reply to the warm and cordial greeting which we have just received.

Coming as we do to these storied hills and silver lakes, although now closed by winter, we are most of us not unfamiliar with your scenery. It requires the charms of summer to make us wish to come to Winthrop to hold a session of the Maine Board of Agriculture. But it is not simply in the outward scenery. There are sacred recollections connected with agricultural history associated with this place—the home of the first agricultural association of the State; the home of the Woods, the Bensons, the Fosters, and those other honored names that have done so much to advance the cause of agriculturre; the home of that revered pastor who did so much, not only for the general interests of the cause of religion, but especially for the general interests of the town of Winthrop and for the cause of humanity as well as for the cause of agriculture, the Rev. David Thurston; the home of that man, whose name is a household word wherever an agricultural paper has been read in the State; that man who did so much to promote the industrial interests of our State, Dr. Holmes, whose latest labors of life were devoted to the performance of duties connected with the founding of the institution where I am now located.

You have well said, sir, that there is dignity and honor connected with industrial pursuits; that honor and dignity belong to the farmer; that farmers do not sufficiently respect themselves and their calling; that they do not command as they should the respect and the honor of all classes. Woe to him who holds in light esteem the employment of productive energy, and thinks it more dignified to live on the labors of others. While the joys and delights which flow from honest industry and toil are such as you represent, what is it, I ask, that should ever produce in the mind either of the working farmer, in the mind of the community, or in the mind of the son who runs away from the farmer's pursuit to engage in the precarious employments in other directions, a contempt for productive employment? There is a cause for it, and I am persuaded that one cause above all others has been, that false estimation, that it does not require intelligence to be a successful farmer; that it is simply "the diligent hand that makes rich," and not the cultivated brain. "What do you mix your paints with, sir," said one to a distinguished artist, "that they should endure so long and shine so bright?" "I mix them with brains, sir," was the reply. The successful farmer, the independent farmer, the systematic farmer to whom you alluded as the one who was so happy, and who was shedding such an influence

around, as he gazes on the landscape, the bright green of summer, and the golden sheaves of autumn, can explain, when asked "with what manures do you dress your soil?" "I dress it with brains, sir." And I am persuaded that every effort, however humble it may be, which shall give more of scientific skill, more of general intelligence to the enterprizing young farmer, and present before him sufficient inducements for the cultivation of his mind, tends to hasten the time when there will be more of these systematic and successful farmers.

Again, sir, let me say, in reply to you, that we are happy to find ourselves already greeted with so warm a welcome.

After the remarks of President ALLEN, a paper was read on

DRAINAGE.

BY LYMAN H. WINSLOW, MEMBER FROM LINCOLN COUNTY.

The subject assigned me is of so wide a nature that my remarks must of necessity be general, and touch but briefly on a few of the most important points.

It is an old and time honored saying, that every thing has its day; and we often hear the remark, that the farm is worn out. Now, this may be true, so far as we have cultivated. It has been the practice of some farmers to continually cultivate, year after year, the same piece of land, until from constant use and insufficient enriching, it has lost much of its strength. Another practice with many has been to cultivate the highest land in order to get on to it sooner in the spring; and they have followed this practice year after year, while every rain has been washing down from these hillsides and knolls the very essence of all the enriching matter put there, into the low lands, swamps and bogs, often laying in the same condition in which nature made them. In many other instances, the trees and bushes having been cut off, and no other work done to them, leaving stumps, roots, old logs and rocks, laying just where they fell or grew, and simply taking from the land a rank kind of third-rate hay, at much trouble to get it. Thus it was, until some live man, studying more deeply into the nature of things than others, who were content to plod on in the beaten pathway in which their fathers had trod for generations before them, conceived the idea of underdraining, and thus gave to the science of farming one of its most important features—for by this practice, that part which in most all farmers, as we have

before stated, received the wash and goodness of the upland, has been reclaimed from its barreness, and this constant and invisible enriching has thus been made of some value by the use of underdraining. By this means this land has become more productive than the higher land, where before draining it was covered in whole or in part by water part of the year. Now, as we go through the country, we meet with but few farms on which there is not a piece of this kind of land in the midst of the otherwise smooth field; and year after year it is worked round and neglected, and left covered with rocks and bushes, almost as rough as when created—and all because of its swampy nature. But by draining that same land can be changed into the very garden spot of the farm. There has come under my immediate knowledge many pieces of land of this kind, which from a mere alder swamp have by clearing and underdraining become of more value than six times their size of high hilly land; and I have many reasons which to my mind are conclusive of this fact. I will try to give a few of them.

Underdraining makes a depository for the surplus rocks on the farm, which are an eye-sore to any farmer of intelligence or pride, in the looks of his farm, by burying them forever out of sight and making smoothness where before was roughness, changing unsightliness for beauty, outs for ins, and that which did not pay for that which does. The land if properly drained can also be worked as soon as the high land, thereby saving the farmer the cost and trouble of keeping his team in the barn late in the spring, before he could finish his planting, had it not been drained. It matters not what crop is put upon such land,—it will give better returns than any other land not so drained. This I know from my own experience. I had on my farm a tract of swampy land which for years had lain rough and rocky, covered in many parts with stumps and bushes, which the previous owners had worked round for two or three generations. Some years ago I drained it, thus hiding the rocks, pulling up the stumps, and cutting away the bushes; and to-day, if there is a spot on my farm to which I turn with pride, it is that same swamp. I love to walk over its smooth surface and see the luxuriant crops springing up in their almost spontaneous growth, causing the whole to look beautiful, and making me forget the trouble and expense of clearing it. Aside from the vast degree of beauty it now has over what it formerly possessed, it has paid more than thribble the cost, for now it is

laid down to grass. Instead of thumping round stumps and rocks for a meager lot of hay, with the hand sythe and rake, I can go on with a mowing machine and horse rake with no fear of stumps or rocks, thus doing the work in less time and with greater ease, to say nothing of the excellent quality of hay produced.

Now, nearly every farm has some of this land, and land of a nature which actually needs draining, and will repay the owner many times the cost of so draining, in the increased yield of the different crops which he may wish to raise thereon. Besides this, the low intervals do not need the amount of manure that higher land does, and they will retain their strength longer, and yield larger crops and of a better quality; neither is it so much labor to work such land when properly drained, for the large boulders are scarcely ever found to stop the plow or around which the farmer must take his team, but as a general thing the smoothest part of the farm, and really worth the most in every respect for any crop. Besides, in cultivating such land, the husbandman has an invisible helper in Nature, who asks no pay, but works not only when he does but when he sleeps, silently but surely enriching all the low land of his farm, and this being so, shall the help which the goodness of Nature is throwing in his way not be looked after, rather than be left to waste, and all the wash which is coming down from the high land at every shower, bringing with it the very heart of whatever fertilizer is put upon the hill or in the land to the lower land, where in too many instances it is received by some frog pond, or floated off by the spring freshets. Why not stop this helper where it is needed, and by draining such low lands, thus leaving the surface free from water? All that flows there must be filtered down through the soil before it can flow off in the channels provided for it, thus leaving in the soil whatever of an enriching nature it may contain.

In conclusion, allow me to express the hope that the farmers of our State will wake up to the importance of this question, and that every swamp and bog which now defaces the beauty of our fields may be underdrained, and thus verify the saying, "That man has made the wild places of this earth bloom in the full beauty which God decreed for him."

THE CHAIRMAN. It would be interesting, of course, to spend time in the discussion of such a subject as has been opened in the brief paper read by the gentleman, but it would not appear best,

at this time, to sandwich a discussion between two papers, but rather to have the papers and then let discussion follow. I will therefore call on Mr. Colburn of Windsor, for a paper on the Management of Dairy Cows.

Management of Dairy Cows.

BY HORACE COLBURN, MEMBER FROM KENNEBEC COUNTY.

At the close of our last session, I was requested by our presiding officer to write a paper on the Feeding and Management of Milch Cows. I told him I would try to do so, but afterwards, on looking over the subject, and finding my inability to do justice to it, I thought I would not write anything at all. But after I learned where this session of the Board was to be held, that it was coming up in the midst of this excellent dairying country, I thought I would present a very few words in the form of some suggestions and hints, that we might draw out from these experienced dairymen of Winthrop, Monmouth and Readfield, some information that will be of value to us. I will, therefore, present a few words. One thing is certain, I shall not weary you, and I hope that every dairyman present will make it a point to discuss this question, that we may draw out from one another some facts which may do us good.

That there has been much written and said on the subject before us, all are aware. In looking over most all writers, we shall find quotations from this writer, and that writer, and this kind of feed is the best, and that kind of feed is the best, and they must be kept in just such stables, and a thousand and one things too numerous to mention. But are we to base our operations on what we see in these rules laid down, or are we to experiment for ourselves. I think that when we come together to discuss these things, that we should give our own experience on the subject of which we speak. If I wanted to see how much profit I could get from a cow in one or two years, I should feed very high, and the kind of food I should give for winter would be good, early cut, hay, all she would eat; roots—should prefer sugar beets, ruta bagas, parsnips, the waste of cabbage, &c.—then oat meal, some Indian meal with shorts; of these I would give all she would eat, this would be for winter. And for summer she must have good high land grazing, oat and Indian meal and shorts, as much of them as she would eat, and keep her appetite good, and in two years at most, you would have all the milk and butter out of her.

Then you must turn her for beef. I know of an instance of this kind. A man in Farmingdale had a cow, as good as he ever heard of; I have forgotten the quantity of milk that she gave, but she gave it constantly. He used this very manner of feeding. At the end of two years, one of his neighbors wanted to buy that cow. He told him he would not sell her. Says he, "I will give you a hundred dollars for her." The owner said, "I won't sell her." "What are you going to do with her?" "I am going to beef her." "Well, why won't you sell her to me? She won't fetch you more than forty or fifty dollars for beef, and I will give you a hundred." Said he, "You would lose all over and above what you could get for her for beef. She is not worth one cent for milk. I have taken it all out of her in the last two years."

Now is this the best way? I think not. If a farmer with ordinary means, happens to get a few cows on hand, the best way is to keep them as many years as he can, and have them profitable; and to have them profitable, he must feed liberally in winter, on good, early cut, English hay, all they will eat up clean. Must commence in that way and keep up to two or three weeks before calving, and then she should have some roots, or meal, or shorts, in moderate quantities through the remainder of the feeding season, feeding salt all she would eat. She should not be kept too close for some weeks before calving. She should have ample room to turn round and lie down. Some farmers seem to think that cows should go dry but a few days if at all; but I think that is wrong. I am well satisfied, if a cow gives milk three-quarters of the time, she needs the other quarter to recuperate. Under this treatment if they come in at two or three, they will grow better until they are seven or eight years old, and retain her vigor, and will be equally profitable when fifteen to twenty years old as when she was seven or eight. I have known one cow, that came under my own observation until she was twenty years old, and the owner said she was then as profitable, or more so, than she had been any year before, but she required a little better keeping. It is not a good policy to buy our cows to recruit our dairy, when we have to put away any. When I have bought cows and brought them into my stock, the others would use them bad, hooking and pushing them round. I have been off to buy cows, and gone to a man whom I knew to be a truthful man and a good judge, and asked him if he had a cow to sell. "Yes." "Is she a good cow?" "Certainly, she is a good cow." (I hardly

ever knew a man who had a cow to sell who would not say she was a good cow, the best cow that could be found.) "How much milk will she give?" "She will give so much,"—perhaps eight or ten quarts a day. Finally, I would conclude to buy the cow, and when I got the cow home she would not give but just about one-half the quantity. I had no reason to doubt the man's word; he no doubt told the truth. My experience convinces me that if you take a cow away from home, and introduce her into a stock of cows, and let them hook and push her about, she will not come up in her yield of milk, to what she did before you bought her. But if raised on the farm they get used to each other, and one cow raised on the farm where kept, is worth considerable more for me than one bought off the farm.

Some always have kicking cows; there is no need of that. It is all in breaking them in. A few years ago, they had at the Insane Hospital a herd of Ayrshires, good milkers, fine animals, but the Superintendent put them away, they were so fractious about milking. I have had some five or six grade Ayrshires to break in the past spring, but have had no trouble. I think it best to have one milker to a cow, not to change if it can possibly be avoided. Never scold, strike or kick. They may be very high strung or nervous, but be very gentle. A cow treated in the manner above mentioned, seldom if ever kicks unless her teats are chapped or sore.

Now, Mr. President and gentlemen, I merely throw out these few suggestions, as I said before, to draw out something from these dairymen who know how to take care of cows, and manage a dairy. I consider this subject of dairying the most important that the farmers of Maine can discuss. In my opinion the only way that we can maintain the fertility of our farms is by keeping a stock of animals to furnish us with manure. I hope you will take this subject up, gentlemen, and that I shall learn something to-day that I can take home with me and that will aid me in carrying on my dairy.

THE CHAIRMAN. You will pardon the Chair for expressing the opinion, that in these discussions the subject is very often too broad; and it strikes me that in the brief time you have to discuss any subject this afternoon, this question of "Dairying," as announced here, is altogether too broad. It gives you too many tangents to fly off upon. I presume there are skilled members of farmers' clubs enough present to confine themselves to the subject

under discussion. It is quite annoying, in conventions of this kind, if the subject is dairying, to have some other subject discussed, very far from dairying. It is far better to confine ourselves to the subject under consideration.

Now, if it meets the views of the Convention, suppose you take up simply the question of feeding milch cows, which the member from Windsor has discussed briefly in the paper to which you have just listened. I believe the time can be better spent in talking upon that one subject than to occupy it in flying back and forth upon the trite subject of dairying.

I will say, furthermore, that the subject is in the hands of the Convention, and no time should be allowed to run to waste. There are talking men enough present, and the Chair would prefer not to call upon any individual, but let us have volunteers.

Mr. CARPENTER of Pittston. We are all so anxious to hear what the Winthrop people have to say, that we would be glad to sit still and listen to them, especially on this particular subject. I do not claim to be a trained farmers' club man, and I am not sure that I can keep on the track so closely as it has been intimated is desirable.

I believe it is admitted, that a great deal depends on the feeding of milch cows. It was said by a man,—I believe his name was Stetson,—who kept more cows than almost any other man in Maine, that you "could not gather grapes from thorns, nor figs from thistles, nor good yellow butter from bulrushes," and it must be true.

Now, how shall this feeding be done? I would like to give my dairy cows all the good hay that they will eat up clean. It is wasteful to give them more than they will eat up clean, and although it requires some judgment to gauge them right in that matter, it can be done by a little observation. Increase the quantity until you find they leave a little in the manger, and then you will know just about how much they will eat up clean.

THE CHAIRMAN. That is a model speech. Now let us have another one.

Mr. ATHERTON of Hallowell. I would like to ask one or two questions. I have not much to say on the subject of feeding. We have kept a good many cows for milking purposes, and fed them with grain and shorts, and have also raised corn fodder and cured it. We have fed it in a green state, but we do not think we get the full benefit of it in that way. Perhaps there are those

here who have raised it for that purpose, and have had some experience in curing it, and feeding it during the winter. Therefore I would ask if it would be profitable to raise corn fodder, cure it, and feed it out in the winter? And again, if it is profitable, and to what extent to feed corn meal to cows, and also shorts, in order to increase the quantity of milk? I would like to know if any of these Winthrop gentlemen have had any experience in feeding corn meal and shorts, and if they have used them in such a way as to know that they have been of real value, so far as dairying purposes are concerned?

Mr. Lloyd H. Snell of Winthrop. My experience in feeding dairy cows has been comparatively brief, having lived upon a farm and kept them only about six years; but I have one advantage that partly makes up for lack of experience, for I have all my life studied physiology, more or less, and I think there is no one thing that will help a man more in feeding his cows than a knowledge of physiology, or hygiene and physiology combined. I think those who are acquainted with it will bear me out in that statement.

However, in regard to the inquiry of the gentlemen last up in regard to experience in feeding corn meal and shorts; I call it very good feed, so far as I know. But there is one thing to be considered, and that is, it is with cows as it is with men—"What is one man's meat is another man's poison." My experience proves to me that different cases want different food, especially under different circumstances. Their constitutions vary, and hence it is difficult and almost impossible to make a rule that will apply to all, and there is a great diversity growing out of that fact. We know it is so among ourselves, and not only so in different individuals, but in the same individuals at different stages of life.

I heartily coincide with most of the remarks that I have heard on this subject from the gentlemen who have spoken upon it. I did not expect to have anything to say, and am not at all prepared, but the subject is one that interests me, because it is the chief source of my livelihood. I will say, before I sit down, that two or three years ago I went about this town and took the census, and I learned then the great difference there was in people in regard to making their cows profitable. The difference was so great that it astonished me very much; and when one gentleman gave us the credit of being one of the first towns in dairying in the

State, I could not help thinking of the expression, "If this is the flower, what is the bramble?"

Mr. CARPENTER. I want to ask one question, and that is, if there is anybody here who knows what a pound of butter costs in Maine?

Mr. COLBURN. I would like to ask if the gentleman inquired how many pounds of butter they made to a cow?

Mr. SNELL. I did, sir.

Mr. COLBURN. I would like to have you give us, as nearly as you can, what they got from a cow.

Mr. SNELL. It was very difficult to ascertain. There were very few people who could undertake to give an answer, to begin with; and when they did undertake to, I had to guess at it in more than nine cases out of ten; but according to the best of my ability, I should say from fifty to a hundred pounds a year, and I have a cow that will give 400. She has made more than 350 pounds, and I keep her so that I calculate to make her good for twenty years. If I had kept her like the cow in Farmingdale that the gentleman told about, I believe I could have got 500 pounds. I was utterly astonished to see how people were getting their living off of farms. Their cows were in a miserable condition, and they were going on in the old ruts, as has been said, without understanding the conditions requisite to the making of any profit. They were discouraged and disgusted with dairying, but followed it as the only resource of life.

THE CHAIRMAN. Will the gentleman explain a little further upon the conditions requisite to the production of three or four hundred pounds of butter?

Mr. SNELL. I have often been accused of feeding high, but I think I am not guilty of it. I say I wish to keep a cow so that she will last and make the most real profit for her owner, until she is twenty years old, and be a good cow then, and consequently I do not feed high. But I wish to feed good English hay, with some little corn meal, shorts, oat meal and roots, and I vary the food somewhat, according to the cow's nature.

THE CHAIRMAN. One word. You say "a little corn meal, shorts, etc." Will you please be a little more definite and tell us how much you mean by a "little."

Mr. SNELL. I say that I vary. I would never give more than two quarts of corn meal daily, if I wished to make a cow last. If I was going to use her up in two years, I would give her all she

would bear. But I never tried that experiment; I never tried to get all I could out of a cow. I never would feed an ordinary sized cow over two quarts of Indian meal per day. My experience, as I have said, has been limited. Other men, who have had much more experience than I have may come here and confidently contradict me. But I base some of my remarks upon the physiological knowledge which I have obtained, and I believe it will pay any man in dollars and cents to obtain a knowledge of physiology in raising a stock of cattle for profit. I recollect I had a conversation with one of my neighbors on that point one day. I applied to him to subscribe for a physiological journal, and he said it was of no account. I knew he was losing his stock at the rate of about one valuable animal a year, and told him the price of that journal might possibly save them. I have been a farmer for six years. I do not say it boastingly, but I have not had a sick animal or an animal lose a meal of victuals from any cause whatever; and I have made the business profitable to me. It is the most profitable business for me that I was ever engaged in, and I attribute the principal part of my success to a knowledge of physiology.

Mr. CARR, of Winthrop. I apprehend there is a gentleman in this room who can tell us how much it costs a pound to make butter, and also something about feeding. I will call on Mr. Snell.

Mr. SNELL. I hardly know what remarks to make on this subject. I have kept cows and milked them, and my wife has made the butter, and I have sold it. I have kept the figures, and know what it costs to keep the cows and about how much butter I get. But it would be a long story, and I do not want to detain the people so long as it would take to go through the whole of it.

THE CHAIRMAN. Tell the convention what your product of butter is. That is just what we want to know.

Mr. SNELL. I have kept my cows since this year came in on what I call fodder corn; southern corn, sowed. It grows stout. I judged there were some eight or ten tons on the acre, after it was dried. It grew ten feet high. I run that through a hay-cutter and feed it to my cows. I give them also four quarts of provender apiece a day; it is a mixture of shorts and cob-meal, half and half. My cows will average now about three months from calving, and they make half a pound of butter a day apiece, on that feed.

Mr. CARR. Tell us what you get per year and what it costs.

Mr. SNELL. If we farmers estimate our labor as some men do who are dealing in other things, perhaps we should run the cost of our butter up pretty high. We have been used to working for small pay. I think my butter costs me thirty cents a pound; I get forty for it. My experience proves that fodder corn works well. I dry all I can of it under cover, let it lie two or three days and wilt a little, then carry it into the barn, (I have had, the last two years, plenty of barn room) and hang it up and dry all I can, and it works in well. It saves the hay for the last part of the season. It is better to feed out fodder corn the first part of the season, and by the way, as it may be of some advantage to farmers, I will say that after fodder corn has been dried in this way on poles, it should be packed down. If it hangs on poles or is put up loose until you want to feed it, it gets so very dry by this time in the winter that cattle dislike it. But pack it down and it will gather a little moisture, which will make it good feed. When I cut it up and give it to my cows they will eat it in preference to hay.

Mr. BRIGGS. I have had some experience in feeding dairy cows. I concur in the remarks that have been made to the effect that there is such a thing as feeding them too high, so that they will not last. The true way is to go between the two extremes. I do not know what it costs me to make a pound of butter; but I am sure that I can do it as cheaply as I can raise a pound of beef. It requires some more labor, but it is much more profitable to me to raise butter than it is to raise beef.

Mr. ROBBINS. I will say one word in regard to fodder corn. Last season was quite an unfavorable one for raising fodder corn. I took occasion to dress a small plat of ground expressly for the raising of that, and I never saw a heavier piece of fodder corn than I raised from some quarter of an acre. I was surprised that such an amount of valuable fodder could be secured from so small a piece of ground. I believe if farmers generally would sow fodder corn, (not to a large extent, but heavily dress it,) and cure it, it will furnish one of the cheapest and best kinds of food for our stock of dairy cows in the early fall and winter.

THE CHAIRMAN. Will Mr. Robbins give us his method of feeding his cows for butter production?

Mr. ROBBINS. A year ago last winter it so happened that my cows were young and coming in as winter cows; and during last winter I fed and milked my cows a great part of the winter; this

year I do not. I fed them last winter up to February, with two quarts of corn meal and two quarts of shorts to each cow in addition to good hay. This year, with the exception of two cows, I milk none of my animals. My heifers are dry, and I prefer to let them rest as they come in in the spring. The two cows I am feeding with two quarts of corn meal and oat meal twice a day. The rest of my cows that are not in milk, I am feeding with oat straw and my poorer quality of hay, and as often as once a week a feed of carrots and also sulphur. I believe in feeding sulphur to dairy cows and all stock. I believe it keeps them in health and is beneficial.

Mr. NICHOLS of Monmouth. I want to know if any of our dairymen here have tried sweet corn for fodder corn, and compared it with Southern corn?

Mr. SMITH of Litchfield. I keep a small dairy of from six to eight cows, and two years ago, I planted both sweet corn and Southern corn. I think the sweet corn is much the best, but the quantity is so much smaller than can be raised on the same piece of ground, that I do not think it is so profitable as Southern corn; so I discarded that, and raise the Southern corn altogether. But this season I have not succeeded in curing fodder corn so that it amounts to much. My experience,—what little I have had,—is, that if we can grow fodder corn, it makes a very good substitute for good hay; but unless we can cure it well, it makes very poor fodder.

Keeping as I do a small dairy, and knowing that this was a famous dairy region, I came here for instruction. There are many men here over whose signatures I have read many articles which have given me instruction, and I came here to hear them talk, not expecting to say a word myself. I hope this discussion will continue. It is a matter in which I am more deeply interested than in any other branch of farming, and I hope it will be thoroughly discussed, and that I shall learn something from it. My experience has been so short and so small, that perhaps it would not be of any consequence for me to state what little I have had in this direction. But I will say that I have found it more profitable than any other branch of farming. I commenced some six or seven years ago. I intended to keep all the cows I could, to the exclusion of all other stock. But of late, I have had rather poor success, butter has declined somewhat in the market, and I have run a little into other stock, and lessened my number of cows. Whether I have done

right in doing so remains to be seen. But I certainly wish that I could make it pay to keep cows exclusively. I prefer dairying to any other branch of farming. I have some grades and some full-blood Jerseys. I make a superior article of butter from these cows, but I do not succeed in getting any money for it per pound. That is the difficulty with me,—to sell a superior article of butter for more than I can get for a common article. If any gentleman here can manufacture a superior article of butter, and get a superior price for it, I would like to hear him tell how he can do it.

Mr. SNELL. I have been accused of getting an extra price for my butter,—I hardly know why. But people will come after it to my house, and give me an extra price for it. When it is known that an article is of extra quality, whatever it is, there is no difficulty in getting an extra price for it in this country. The gentleman's trouble is in not making people understand the difference. He has got to take some pains to do that, perhaps sacrifice a little, (I don't know but that is a Yankee trick,)—make a present of a few pounds to some man, if he can't convince him without.

Mr. GROVER. I presume I cannot edify these Winthrop people much about keeping Jerseys. I was brought up on a farm, but I have dabbled in other things a little. Since coming to Winthrop, I have kept Jersey cows, and have succeeded in making people believe my butter was good butter, and getting a good price. I have furnished the State Department at Augusta some butter, and they were glad to get it, and pay me a good price for it—from 40 to 45 cents a pound this past season. I keep good cows; cows that give good milk; that make yellow butter, well handled—that is a part of the trick.

I think the best feed we can give Jersey cows, if we do not overdo it, is corn meal, to make good butter; but it is better to mix oat meal with it. If we give our cows that have matured three quarts of corn and oat meal, in equal parts, they will do well on it. It will make good milk, a good deal of it, and make good butter.

I was interested in what Mr. Smith said of fodder corn. There is a query in my mind yet whether fodder from Southern corn is more valuable, at the cost, than sweet corn. I have tried both. It is more trouble to grow southern corn; it is more uncertain whether you get a good yield or not; there is a greater amount grows on the ground, consequently it saps the ground

more; and to my mind it is not certain that sweet corn is not more profitable, take it all in all. I think there is more milk in it, and I have come to the conclusion that I prefer to raise it to the Southern fodder corn. I am not certain about the cost of making butter, but I am certain of one thing,—that if we take pains, we can get better pay for making butter than we can for any other kind of farming that I have practiced.

Mr. SIMPSON of Bangor. This butter making business is a matter of considerable importance, and as we all like good butter, I hope that the request will be made of the good people of this town to exhibit to us some of their butter to-morrow, that we may see what they make. In years past, we used to get good butter from the Kennebec at Bangor, but since the opening of the railroad, we get very little butter made in this section. We get a large portion of our supply from Vermont and New York, and we have to pay a very good price for it. We pay a great deal more than the average price of home-made butter. The price of Vermont butter stands higher than any other butter that we have. Now, if you can make better butter here in Kennebec county than is made in Vermont, which I have no doubt you do, or can, our market might be supplied partially from this section. I wish it might be. A good article of butter will always sell, no matter to what market it is carried. If you can bring a good article of butter into the Bangor market, you will always find ready customers for it.

THE CHAIRMAN. I will put the motion, that the ladies of Winthrop be requested to exhibit to-morrow samples of their butter, in quantities sufficient to butter the bread of our brother Simpson to his satisfaction, if no more.

The Chair continued: The discussion, thus far, has been confined to gentlemen who are engaged in butter making. We have another dairy interest represented here, which is the production of milk for market. You will bear in mind that this Convention covers the whole State of Maine; consequently we have not exhausted our talking material yet, by a great deal. The fear was whispered in my ear a few moments ago, that if we confined the discussion to the feeding of cows, we should find ourselves short of material. I think we have material enough to keep the machine running some time. I will call upon Mr. Charles H. Cobb of Poland, for his method of feeding for the production of milk. He represents a section which is feeding for the production of milk for the Portland market.

Mr. COBB. I should judge from the talk here this afternoon, that milk was produced in this section for butter and no other purpose. I would say that in our section, we produce milk entirely for the Portland and Lewiston markets, which goes directly to Portland every morning at half past six o'clock in the train, and to Lewiston at the same time by team. We consider it more profitable to raise milk for market than to make butter. We either do not have such smart women, or else the women here have more taste for making butter than ours, for we prefer to buy our butter and sell our milk. I am not prepared to state how much it costs per gallon to make our milk or anything of that kind, but I find by the figures I have kept, that a good cow will pay a hundred dollars a year, (including the cost of keeping.) In ordinary times it costs, as near as I can estimate, fifty dollars a year to keep a cow that will give milk. I have been somewhat surprised this afternoon to hear these gentlemen tell of their cows going dry three months. It is a rare thing that our cows go dry one month. It is about impossible for them to do so. We feed simply Indian meal and shorts, and consider it the best feed we can give our cows for the production of milk. A larger quantity is produced from that than from any other feed; with the exception of feeding old cows that are nearly worn out, upon cotton-seed meal. That will kill a cow if nothing else will, in a few years. A gentleman has remarked here that feeding a cow high would run here out in two years. That is not the case with us. There are cows in our neighborhood twenty-one years old, that are in good condition, and giving a good flow of milk at the present time, and they have been kept ever since they were four years old, on Indian meal and shorts, both summer and winter, with the exception of having some cotton-seed meal the last few years in addition. That proves to us that a cow will not wear out in two years of high feed, and that our cows come in in better condition and are paying a greater profit at an older age than when young; but we can drive milk out of a young cow much cheaper than we can an old one.

In relation to fodder corn—a subject that has been referred to this afternoon—I have had some experience. I have experimented in raising fodder corn for my cows, both in the fall and winter. I find that in the fall, the fodder corn helps out the pastures, but it will not keep up their flow of milk alone; they must have, in addition to this, some shorts and some meal. Until the last two

years I have raised the southern fodder corn; for two years past I have raised the large sweet corn, and find that it can be raised to great advantage. This last year I sowed one-quarter of an acre, and from that piece which was measured by a committee of three, and the crop weighed by the same, and presented at the county show for premium, I raised nine tons and eight hundred pounds of corn fodder—green. That corn fodder I consider worth more than any other dry feed that can be given to cows. In the first place, this fodder is so sweet when dry, that the cows will eat it up perfectly clean; they will not leave a stalk, even if it is an inch or an inch and a half through, and it will not be larger than that if you sow it thick enough. Our cows will give more milk from this sweet corn fodder than from any other fodder we raise. We give our new milch cows, those that came in this fall, four quarts of Indian meal and six quarts of shorts, with a foddering of this corn at noon. This is an extra quantity of provender, but we do not calculate to feed the best quality of hay. We do not feed this nice quality of hay of which these gentlemen speak, to our cows that give milk; it does not pay. I would rather have half the value of that nice hay expended in shorts and meal to make milk, than to have the hay. I think the nice hay is better for oxen and horses than it is for cows, in proportion to what it is worth. There is no way that we can make farming pay so well as by keeping cows and selling our milk, and with the majority of us, that is all the stock we keep, except what oxen and horses we keep to do our work.

The Chairman. Before you sit down, will you please state what proportional part of the year you feed meal and shorts?

Mr. Cobb. To cows that calved last fall we feed this amount of meal and shorts for the first six months. After that we reduce the amount, as their time for calving approaches. The cows that we are milking now, that calve in March or April, we simply give a quart of meal a day and two quarts of shorts, and so reduce it down in that proportion. The majority of cows that milkmen will keep will not go dry but a short time. Some will go dry that are not natural milkers, and they are better for butter or something else. We do not consider those cows the best that will make this nice "gilt-edged" butter, but those that will give the greatest quantity of milk and pay us the largest amount of money.

The Chairman. Do you continue feeding shorts and meal during the summer season?

Mr. COBB. No. There are two months in the year that we do not give any provender at all. There are a few milkmen in our vicinity who do it, and but few.

QUESTION. Do you scald your meal?

Mr. COBB. Yes, sir, the meal and shorts together; let it set until it is cool, and when it is cool give it to the cows, and give it to them quite moist. I should also recommend the feeding of sulphur, as one gentleman has suggested. I have been in the business the last seven years, and have never lost an animal, but I have had some cows that have been sick. I believe that sulphur keeps them in good condition, and I would recommend every one to feed it. So far as salting is concerned I believe in keeping salt in the shed, so that the cows can go to it whenever they please, instead of putting a handful into their provender so that they must eat it, or not have their provender, and perhaps not feeding any more for a month. Let them have it by them and they can eat just what they want.

QUESTION. What quantity of sulphur?

Mr. COBB. I give them a great spoonful once a week.

THE CHAIRMAN. The gentleman has had some experience in steaming fodder. Will he state that?

Mr. COBB. My experience in that matter has been very slight. When my cattle came to the barn last fall there was plenty of room in it, and not much to give them, (perhaps some of you found yourselves in the same predicament,) and consequently I had to economize and make the most of what I had. I had heard and read a good deal about steaming food for stock, but I had no chance to steam it, as many do who practice it. I keep eight cows and two horses. I had a large box made, water tight, sufficiently large to hold the feed for my stock either at night or in the morning. I fed them once in the morning and once at night with this steamed food, and at noon with dry corn fodder. This box I filled with chopped feed, mixed meal and shorts with it, then heated water in a boiler, brought it into the barn, and saturated the feed with it; then covered it tight so that it would steam six hours, at least, and let it cook all through—the poor hay, straw, meal and shorts. That worked well. I found by so doing I saved fifty-three pounds of hay a day, on eight cows and two horses. I thought that was paying me something, and I found by so doing we could do our chores just as quick as we could when we fed in the old way. Then we tried the experiment of

putting the feed into the box without chopping, steaming it in the same way, and it worked well. There was but a trifling difference whether the fodder was chopped or put in without being chopped. We practiced that until our cattle went out in the spring, and considered it very profitable. But I consider that it would have been more profitable if we had had steam pipes and not been obliged to heat the water on the stove and carry it out.

Mr. BARROWS of Fryeburg. I think we are getting some very valuable testimony this afternoon; but it occurs to me that it is not quiet so complete in some particulars as it might be. The remarks of the gentleman last up suggested to me that if I was a reporter here to-day I should be obliged to report that the almost unanimous testimony of the gentlemen who have spoken this afternoon was adverse to cooking food for cows. This would be an inference, not a direct statement, from any of the gentlemen. Now, I think it essential that those gentlemen who have spoken on this subject, or who may speak, should state whether or not they have had any experience in cooking food for cows, and if they have, whether they think it pays to cook food for cows or other animals. I think it is necessary we should have some statements made on this point. We are all aware that in other States, the universal sentiment seems to be in favor of cooking food; but with the exception of the last gentleman up, no reference has been made to this point.

Mr. COBB. I wish to say one word that I forgot. Last June we tried the experiment to know whether it was more profitable for us to make butter or sell our milk, at present prices. Our milk is sold in two gallon cans at the depot for thirty cents a can in summer, and thirty-five cents in winter; six months thirty cents, and six months thirty-five cents. The milk is carried directly from the depot to Portland and the money brought back, which saves us all the trouble of marketing it. We were in doubt whether it would pay us best to sell milk or make butter; so last June, when the milk would make as much butter as ever it would, we saved fourteen cans and a half of milk, that is, twenty-nine gallons, and made it into butter, and it made just twelve pounds of butter. Whether or not our cows are not so good for butter making as some others, it is for you to decide, but that is what our cows made from twenty-nine gallons of milk.

QUESTION. How much was the butter worth, and how much was the milk worth?

Mr. COBB. The milk was worth thirty cents a can; the butter brought twenty-eight cents at the depot.

On motion of Mr. Colburn a committee of three was appointed, consisting of Messrs. Colburn of Kennebec, Hawes of Knox, and Lang of Waldo, to receive the credentials of delegates present from Farmers' Clubs.

The Convention then adjourned to evening.

EVENING SESSION.

The first exercise of the evening was the reading of a paper

On LABOR.

BY A. L. SIMPSON, ESQ., MEMBER FROM PENOBSCOT COUNTY.

Labor, from the earliest ages and by all peoples, has been regarded and endured as a part of the primeval curse, under the belief, that if Father Adam had resisted the temptation and not eaten the forbidden fruit, the earth would have yielded spontaneously, and man would have had nothing to do but repose upon the voluptuous bosom of mother earth, and live in luxurious ease.

This erroneous belief has appertained from a wrong interpretation and misunderstanding of the Bible. It has been so long taught, it has become a part of our nature and life, and has borne us down as a heavy weight. Theologians have had it, that in consequence of Adam's eating the forbidden fruit, work,—labor as it is termed,—has been introduced into the world, and man has been compelled to eat his bread by the sweat of his brow. If this were true, then that which is regarded as a curse is the greatest of blessings. No greater curse could come upon man, then that state which is supposed to have existed before the fall. No more miserable state can be conceived than one of idleness—nothing to do, no higher goal to aim at, no useful life to live, no ennobling and elevating work to perform.

Such a state would have caused the destruction of the human races long ago; such a state would destroy heaven itself; it would lead man into all manner of vices and corruptions, and like as fire destroys itself by consuming that which gives it life,—so would mankind be destroyed. From this erroneous belief man has regarded all useful work, labor, and he has failed to observe the distinction between work and labor. Our most learned and able lexicographers have failed to properly define the distinction

between work and labor, and in common parlance the words are used synonymously when applied to man, but when they are applied to machinery they are better defined and understood, for the reason I suppose, that the curse does'nt apply to machinery. In speaking of machinery, when well constructed, each part properly adjusted to all other parts, and all things are in order, we say they *work* well; but when they are disjointed, out of order, and the parts not properly adapted to each other, we say they *labor*.

When man adapts himself to the work and uses which Providence designed him to perform, and when there shall be no friction between mind and body, then man will work and not labor; for work is not necessarily labor, whether performed by the hod carrier, the miner, the mechanic, the farmer, the manufacturer, the merchant, the inventor or the professional man. Each of these employments may be made recreative work or fatiguing labor,—whether it be work or labor depends upon the state of the mind and the infirmities of the body, which have been superinduced by the state of the mind. If work is entered upon in the right spirit, it gives health and strength to body, relish to the appetite, and quietness and cheerfulness to the mind, and places the whole man in a proper state to rest. And as Paley says, "No man can rest who does not work;" and it may be said with truth, the man who does not rest, labors.

If men enter upon their various occupations with dread and loathing, and for *pag* only, then they will labor, and like Noah's dove, "will find no rest for the soles of their feet;" but if they enter into their business and employments with unselfish aims, and for the purpose of doing good and performing the uses which Providence designed them to perform, then their work will be easy and their burden light.

In consequence of this erroneous belief, man has perverted all work and converted it into labor, and everything he does that is useful he denominates labor, and avoids and shuns it as much as is possible, while those things which in their performance are more laborious, but are denominated sports and games, are entered upon with pleasure, and are carried on with a will and without fatigue. We have all observed this in men and boys when they go hunting, fishing, or engage in any sports or games, also in delicate ladies and gentlemen in attending dances, which are conducted with so much motion, activity and spirit, that the foreigner

while looking upon the dancers exclaimed, "that in his country when ladies and gentlemen had work like that to perform they hired it done." Yet we find all these games, sports and pastimes, are carried on without fatigue, and the parties return from them like Noah's other dove, with the olive leaf, and they rest.

Every farmer has seen this truth illustrated in his boys, when he has given them a piece of ground to plant and take care for themselves, to raise beans or potatoes to sell to buy a knife, a pair of skates, a gun, or to obtain money to spend at the *old* General Muster, or for the Fourth of July, or to buy Christmas presents. Yet farmers know well how cheerfully their boys will work, and how cheerfully they too worked when they were boys, on such occasions; they know how sweet the music of the birds was to them, as they were spirited on by their songs from the distant grove,—how they watched the sun as he sank behind the western hills, and how they wished they might stay him in his course, and lengthen out the day; when at last night came how ready they were to help the girls do the milking, and then retire and sleep the sweet sleep of rest. It may be so with all, whatever our employment may be, we can make it pleasant work or fatiguing labor.

The belief that labor or work is a part of the primeval curse, creates a spirit of discontent and jealousy, and leads man to believe that his business or employment is more onerous than others, and he is uneasy and desires a change. Farmers' sons and daughters long for city and village life, while the village and city merchant and professional man think when winter comes, if they had chosen farming for their calling they would have laid up in store their winter supply, and could sit at their fire-sides in the long winter evenings and eat apples and drink cider, read and rest, and not be compelled to spend their long winter evenings in their counting-rooms at their ledgers to ascertain where to raise money to meet their bank notes. But all cannot be farmers, if they were to be, there would be no one to purchase their products; neither can all be merchants, if they would there would be no commodities to deal in; to make a complete whole every branch of business must be carried on, and each has its hardships and each its pleasures; and in selecting our business we should be careful to engage in that which we can adapt ourselves to, and then enter upon it in the right spirit, and with a determination to fill that place in the world which was designed we should fill. When each

fills *full* his allotted place, then each will perform a use to the other, and all will be useful alike.

It should be impressed upon the young men and women of Maine that no useful branch of business can be carried on, honestly and successfully, without diligent, active and faithful work; that farming is no more laborious than that of any other business, that to shun the curse, they must not think they must shun all kinds of work, for to shun useful work is the direct way to bring the curse upon them.

There seems to be an idea prevailing among some people, that everything which is called labor is degrading, and to avoid the degradation they seek such employments as are not called labor; and many women, carrying the idea a little further, abandon all employment, even the care of their wardrobe and that of their children, and these last they would not have if they could avoid it, and instead of being useful members of society, they stand in the way of progress and the elevation of man. The curse falls upon them, and they entail it upon society; they create discontent and stir up the evil passion of man and antagonism to labor and capital.

If we would cure these evils, we must get rid of these erroneous ideas. We must not believe that in Adam's eating an apple the curse of labor was entailed upon the human races. We must learn that in the creation it was designed that to be happy man must *work*; that there can be no happiness without *useful* work—no *rest* without work—that we must imitate our creator. God is continuous in his works, never ceasing. To be useful and happy we must imitate Him. Happiness in this life as well as in spiritual life is inseparable from the performance of uses.

We must learn that there is no degradation in useful work, and that we should not measure a man by his business or employment, but by his qualities; that we should not weigh him by his wealth and position, but by his integrity, honesty and goodness.

We must learn that the honest poor may do more to elevate and make man better than the dishonest rich; that Peabody, with his great wealth and stupendous gifts, may not have done so much for humanity as the poor woman has who cast her two mites into the treasury; that though more than eighteen hundred years have elapsed since her little deed, yet her name still lives fresh in the memory of all, and will continue to live, while that of Peabody's may be forgotten. We must learn that it is not great deeds but

good acts that are not forgotten, and perform the greatest uses. *If we would rise higher we must do it by an honest, faithful and true life.* This erroneous belief and its effects have produced a dearth of laboring people. The intermediate and direct causes are various. The late cruel war, was a contest between capital and labor, and did its part. It called into the service the young men of the country, both north and south, many of whom never returned, but whose lives were offered as holocaust by the contending elements, and thousands of others returned with shattered constitutions, rendering them unable to perform manual labor. Our extravagant mode of living has had its influence; each person has been striving to live better than his neighbor—those who live the highest, dress the most elegant and have the most splendid equipage, are recognized as the *elite* of society, without any regard to their culture or quality, and they are held up as evidences of an avoidance of the curse of labor—while they are weighed down with the curse. This external splendor and show deters young men from marrying, for they know they cannot support a family and keep up all this extravagance, consequently we have an innumerable number of old bachelors and maids who never marry, but disobey the injunction "to multiply and replenish the earth," and from the same cause those who do marry find they cannot maintain their position in *such* society and have children, demanding their care and attention, and the result is, it has become unpopular for married people to have children. *This* society looks upon all labor as degradation, consequently many men and women have no honest calling or business, and thousands from idleness are driven to theft and most loathsome crimes.

If we would eradicate these evils we must educate ourselves out of this erroneous belief and remodle society. We must not have for its boundaries wealth, birth, learning, professional occupation, but virtue, integrity, honesty and goodness.

What if the profligate and libertine, who are admitted into this society, are graceful and easy in manners, and can sing and dance; are they the young men to whom you whish to introduce your daughters? Are they such young men as you would choose to be their husbands and fathers of their children? If not, then why do you introduce them into your society?

This dearth of labor can be supplied if we will adopt right beliefs and a correct life. We can supply it by the immigration of the Chinese and Japanese, and by a proper treatment of them—

they are the best working class of people in the world. They had rather work than fight; to avoid fighting the Chinese built the great wall to protect themselves from their enemies. They are a hardy race, skillful mechanics, good cultivators of the soil, industrious and honest. In their country they understand how to till the same soil for a succession of years without exhausting it.

We must also get rid of the antagonism which exists between capital and labor, for this creates dissensions and disorders, and the forces which would favor each other if they acted in harmony, now oppose them both; and instead of finding help from each other each finds hindrances everywhere. In order to restore harmony these forces must be made to balance each other and to work for each other's good, for every branch of business and profession is dependent upon every other. It would not do to have every man a laborer nor every man a capitalist, for labor without capital cannot be remunerated, and capital without labor would be useless. Instead of being independent, man is a dependent being. This was recently illustrated by the disease among horses—the suspension of their work stagnated all branches of business, and evidenced man's dependence upon the horse. Railroads and steam-boats could not receive their freight and passengers, merchants could not have their goods delivered, the markets could not be supplied, housekeepers could not have their groceries and meats delivered, the horse cars ceased running, men could not get to and from their places of business, doctors could not visit their patients, the Boston fire could not be stayed in its devastating progress, the streets of our cities looked as if they had been deserted, and a general apathy prevailed; after this short experience we ought to be able to realize our dependence. It ought to teach the capitalists that it is not for their interest to antagonize labor, and the laborer that he ought not to antagonize capital, for without labor capital would have to lie dormant, and without capital there would be nothing to remunerate the laborer. Each should understand their dependence upon the other. The laborers should understand that it is not for their interest to demand of the capitalists all their earnings as pay for their labor, for if in years of prosperity capitalists laid up nothing, in years of famine they would have nothing to pay their laborers with. Experience shows that they do have their seven years of famine as well as their seven years of plenty. In the years of plenty it is not for the interest of the laborers to get up their labor leagues and have their

labor strikes; their effect is to cripple and destroy business and throw the laboring men out of employment.

Farmers understand that they must lay up in summer for their winter wants, and that they must in years of plenty keep over their hay, so as not to be compelled in years of scarcity to reduce their stock.

Labor leagues and labor strikes cannot be of any real advantage to the laborer; their effect is like fire which destroys itself by consuming that which gives it life. They are like all evils which create their own enemies, and arms them for their own destruction.

Neither is it for the interest of capitalists and producers to get up their organizations to keep up the price of their goods and products at the expense of the consumer; such is not a healthy mode of doing business. It destroys all fair competition, and prevents men of small capital from entering into business. The combinations to create corners in gold, flour, corn, and other goods and products, are all antagonistic to the best interests, prosperity and happiness of the people,—they create a great evil and arm it with weapons of destruction.

A severe warfare is now going on between capital and labor,—capital may have had the advantage, but labor now seems to have got the ascendency, and if possible, it is more selfish and tyrannous than ever capital was.

It says to every man, you shall not work at all unless you ask our price; and if they attempt it, they are mobbed and driven away. Capitalists refuse to accede to their demands, and stop their business, and the laborer fails to find employment, and the whole people suffer. We cannot have prosperity until these now conflicting elements become harmonized,—until the laborer learns that it is for his interest to work for the interest of his employer, and until the capitalist learns that it is for his interest to fairly compensate the laborer for his work.

Laboring men, since this scarcity of labor, seem to take the advantage of the situation. Since the war they have seen men, by speculations and peculations, grow suddenly rich, that were before upon an equality with them; have seen them for their riches taken into society, and courted and petted, which have made them discontented with their situation, and instead of working for the interest of their employer, they seem to try to see how little work they can do for the most pay. And it is shown by

statistics that three laboring men now will not perform any more work in a day than two would before the war, while now they receive about fifty per cent. a day more than they did then. The result is goods and productions have advanced in price corresponding with the increased price and diminished quantity of labor. This depresses business and hinders prosperity.

If we would end this conflict and restore harmony between capital and labor, we must reform society; we must have virtue and honesty for its gateways, and honest work must not be regarded as a curse and degradation—and we must have it the delight, joy and happiness of every household and of society to have in every family gladsome and frolicksome children; we must get rid of our prejudices against the Chinese and Japanese and encourage their immigration to this country and let them fill the places of the laborers which have been made vacant by the cruel war. Then productions will increase and the price of goods diminish. We must be the good Samaritan to them, instead of the thieves to wound and ill-treat them. Capitalists must learn to be just to their workmen, and workmen must be faithful to the interests of their employers. All must adopt the golden rule, "To do to others as we would have them do to us," then there will be no scarcity of capital or labor; capital will be prospered and labor remunerated; every one will have enough to be satisfied.

Following the paper of Mr. Simpson was a lecture on

Our Wants and our Resources.

BY J. W. LANG, MEMBER FROM WALDO COUNTY.

The State of Maine may well be called "the enchanted land." This need raise no Utopion visions of perfect blessedness, or spice laden Isles of the Orient, or tropical Eden of some far off South Sea Island. We need draw no treasures from Eastern lore, or search the mythological realms for beauties with which to adorn, or colors to paint our native State. Rough and rugged of bosom, sea girt and forest bound, channelled with mighty rivers "mountain fern," gemmed with emerald lakes lavishly bestrewn, with granite soil and slaty veins, we have a glorious natural heritage in the grand old Pine Tree State, whose motto—Dirigo—"I direct," is stamped upon every son and daughter nurtured on her ample lap, or which her broad arms enfold. This enchanted land is full of promise, and great developments lie in the near future, if

we, her children, but do our duty. With 2,500 miles of sea coast line, with noble harbors where the fleets of all nations could shelter and yet leave ample room for more, with granite and slate practicably inexhaustable, with lime enough to supply the world for centuries, with ore that smelts into the finest iron whose toughness is unequalled, with vast and easily accessable supplies of lumber, with a water power unequalled upon equal area anywhere upon the face of the globe, with a soil naturally superior to the rest of New England and much of the West and South, what wonder then that we term it the enchanted land!

And what and where is this Maine—this Land of Promise—situated? Why hasn't the world heard of its wonderful resources before, and come hither and pitched the abode of happy millions? Why is the dark forest to-day covering three-fourths of her surface, and her sons hieing away to every other State in the Union to seek homes and fortunes? Why is not the busy hum of industrious manufactories heard by every waterfall, and why steals the shadow of decline over many sections? For many reasons, some of which we hope to point out.

In the northeast corner of the United States, forming the most northeast State of the Union, bounded on the north by the Province of Quebec, on the east by New Brunswick, on the south by the ocean waters, on the west by New Hampshire and Quebec, containing an area of 32,000 square miles, or 2,000,000 acres, we find this native State of ours, which is geographically larger then all the rest of New England. Its length diagonally from the Piscataqua to the northern angle is 320 miles; its greatest width from the sea to the Canada line is 160 miles; and on a straight line from the Piscataqua river to Quoddy Head is 250 miles. Its surface is diversified; the central, western and northwestern portions rising into lofty summits, the highest of which is Mt. Katahdin 5,300 feet above the sea level; Mt. Abraham in Franklin county 3,400, and Mt. Blue in the same county 2,800 feet high; Marr's hill in Aroostook county 2,000 feet high; the Highlands at the monument on the Canada line 2,000 feet above the sea. Along the coast, Mt. Desert is 2,000 feet high; Camden hills 1,500, and Agamenticus 670 feet high. These coast eminences serve the mariner as beacons to guide his approach to the coast.

Among the hills and ranges of highlands are interspersed rich valleys, rolling sections, and widespread arable lands, suited to all kinds of husbandry, inviting, well watered, through which flow

noble rivers, some of which are the outflow of lakes, others the product of united brooks from highland springs. A net-work of railroads is spreading over the older portions, and penetrating even the newer regions. Statistics bear me out in stating that the climate of Maine is healthy, though our winters are long and sometimes severe, and our summers half tropical in fervid heats and rapid development of vegetation.

The general idea outside is, that our climate is cold, bleak and damp, and our soil barren; that our State is a good place to raise smart men and women in, and to emigrate from; that it is away down east somewhere toward the jumping off place, whose chief exports are lumber, ice and emigrants, and that it has few sources of wealth outside its timber lands. How very erroneous this opinion, which becomes more and more pronounced as we go West. I call to mind what an Ohio man said when his eyes had been somewhat opened to the true state of our resources and attainments. Said he, "I had formed the idea from my school-day geography that the chief productions of Maine were 'Tar, pitch and lumber,' and that its inhabitants made good sailors and lumbermen, and first-class emigrants to any new State. So much for early education, and early book makers. Time develops all things and makes the wilderness blossom as the rose." Now, friends, when everything is pressed into service against us, even school-books made to misrepresent us, it is time to be "kicking round." It is time to show by works, as well as by words, that we "still live" and have a prospect big with future promise, and that we are going for it!

We should be glad to tell you of remarkable developments made during the last three decades, and more especially during the last one. It would be pleasant and gratifying no doubt, but just here we find an obstacle in the path; it is the census returns. We are compelled to admit in seeming contradiction to the claim made for Maine, that the State has retrograded in population during the past ten years, while the ratio of increase the three previous decades has steadily lessened. Wherefore this decline, when, if the claim be correct, the State ought to have advanced in wealth and population proportionately with her sister States? A variety of causes have conspired to this. Two of these are fundamental. The first is expressed in Bishop Berkley's lines, oft quoted, "Westward the Star of Empire takes its way." And so strong for years has been the current that way as to be irresistable to a

people fond of change and adventure. It has drawn from the East the flower of its youth, and Maine especially has suffered from this exodus. The prairies of the West, the rich mines of the Pacific slope, and the sunny South have beckoned from their homes thousands of her youth, whose energy, skill and courage, if employed within the limits of their native State, might have yielded them a richer return than they can hope for now, while it would have built up immensely their native place.

The second, and the most vital cause, underlying the first, and much the cause of it, is in the mistaken policy which has too long been pursued, even from the date of its birth, almost down to the present hour,—a policy which has crushed out much enterprise, and palsied every avenue of production and trade, and which has placed an incubus upon the prosperity of the State which half a century will hardly remove. This policy may be called very appropriately the pastoral policy, and were Maine purely an agricultural State, like some of our southern sisters, it might have been well. But Maine is only in part an agricultural State. She has other and leading interests with this Her geographical position, her immense sea-coast line with many splendid harbors, her wealth of forest, and her quarries, give her great commercial importance. Her mineral resources and her water power give her great manufacturing facilities. In these two directions her natural supremacy is beyond description. Yet the State has been governed as only an agricultural State should be, and the result is apparent and the census tells the story. To a desire for primitive simplicity, a Jeffersonian strict construction, a fear to introduce innovations, the crushing out of a liberal spirit, must the slow development and growth of our State be attributed. Had its legislature years ago discarded the narrow line of strict construction and adopted a liberal policy encouraging the growth of manufactures and development of resources, we should to-day as a State be what we are not now, but which we must become to grow and thrive. The opening up of new lands, the working of our granite and slate quarries, the utilizing of our immense water-power, would not have been so long delayed, and counter-parts of Manchester, Lowell and Lawrence, would have been found in very many more places than Lewiston, Augusta and Biddeford. But a narrow policy has prevailed, and even now too much abounds; and as the State, so the towns and the inhabitants. The stand-still policy at the

seat of government necessarily permeates all departments, and so thoroughly have the people become imbued with popular lethargy that fathers counsel the departure of sons to distant States, more promising only because more enterprising; and counsel this with satisfaction. No attempt has been made till recently to stop emigration from the State, or to turn the foreign tide here. Maine has remained stationary while the tide of enterprise and improvement has swept past her borders.

It is pleasing to note the evidences of an awakening from this Rip Van Winkle sleep all over the State, more particularly in the central and eastern portions. It augurs well for the future, and encourages progressionists. We may not expect the desired change in a day nor a year. The old strict construction spirit will yield but slowly, but yield it must. Who dare set the limits of our future, when a liberal spirit shall prevail, and home development be the order of the day?

Under the circumstances which we as citizens are placed, and in this transition period as we regard it, and as desired aids to the better state of things desired and possible, having glanced at our resources and present standing, it may be well to notice some of our wants.

First and foremost we want a better system of education. Our present one in many respects has outlived its usefulness. It is amply fit to be laid away in the archives of the past. It is full of injustice and absurdity. Public education lies at the root of our prosperity, State and national, and is the guarantee of progress and perpetuation of all that is desirable, if it is itself that which it should be. It is a source of wealth and key to our development. We want a system more in consonance with the demands of practical life,—less literary and more useful,—and one that shall confer its benefits on a larger percentage than is now done. We are educating our children in a manner almost wholly foreign to their future life on the farm or in the shop, and this is one great reason why so few remain there. We are fitting them for anything but farmers and mechanics. In this we want reform, and we also want more school in the rural districts.

We want more scientific farming, and less guess-work, and chance operations. Scientific farming consists in getting the greatest profit from the soil and leaving it in better condition for succeeding crops. It lessens the labor and increases the yield. To do this everything must be done at the right time and in the

best manner possible. It requires the best brain of the country. It requires the united effort of all agriculturists and scientific men working together. By drainage, surplus water is taken from the soil; by cultivation weeds are destroyed and the crop nurtured; by manure the land is enriched; by rotation of crops the largest yield is secured; by improving stock, feed is economized, and made of more value. How to do all this is the sum and substance of scientific farming. Any and every farmer who by the use of his reasoning powers is enabled to raise one bushel of corn more than he has done before, is a scientific farmer to that extent, however much he may disown the name or decry "book farmers." The world is so much better off as he has increased his crop, and he is so much a public benefactor. The successful farmer has a more extended field, and one requiring more thorough scientific knowledge, also one better calculated to develop the physical system and give discipline to the reasoning faculties than that of any other calling given to mankind. Scientific farming also means more faith in our business of tilling the soil, because of our vantage of working understandingly. It means more thought blended with our business; it means correct accounts of all farm crops and processes that we may draw inferences, and avoid losses in following years; it means more self respect, and more "stick-to-it-iveness;" it means business principles applied to the farming business; *it means success.*

We want more cows and sheep; less horses and dogs. Maine possesses great grazing facilities, and has thousands and thousands of acres of the best sheep pasturage, and this available for no other purpose, except, perhaps, to grow timber upon. Butter, cheese and wool, should be our three leading articles for sale, not as now, hay, potatoes and grain. The production of these profitable articles will consume our vegetable products, last named, upon the farm, and we shall have larger manure heaps and a fatter pocket book. Our hungry soils will appreciate the bountiful return of fertilizers we can then make them, and respond anew with vigor. Grazing must ever be a leading feature of our husbandry, and we should not be slow to accept the fact.

We want associated dairies established in abundance. This will induce the keeping of cows largely, and relieve the farmers' wives of much hard labor. It will also greatly facilitate pork raising from the refuse of these factories, and also the growth of wheat, and stimulate grass production. It will induce the growing

largely of special forage crops for soiling in the autumn. In a word it will work a revolution for good in very many sections. Its feasibility is now established beyond a doubt. It pays, and richly too, and we doubt not that the year 1880 will see 100 cheese factories in operation in the Pine Tree State.

We want more Farmers' Clubs established and sustained. We need one in every rural town. They are the nurseries of improvement; they beget noble emulation, and cause interest not otherwise attainable. We want in addition to these, and as a connecting link between them and the Board of Agriculture, County Associations, of which, as yet, we have but three in the State. The Farmers' Club is the laborer's friend, and the employer's helper; the poor man's opportunity, and the rich man's privilege. They are a school of intrinsic worth. Here are given and received, at each meeting, lessons of much value; experiences are compared, experiments reported, and deductions drawn. The attendance should be regular and as prompt as church going.

We want more agricultural fairs and better attendance. We want them held for the improvement of agriculture, and not for gamesters and jockeys. We are willing that the horse should have a fair share, and equal premiums with other stock, and no more. If the object is by horse races to "draw the crowd,"—if a third or a half of the premiums must go to this one class—trotters—we have come to a pass that I deplore. If the object is to call out an attendance in order that gate money may be obtained, then go in for other means as well as trotting. Have a prize fight, a bull fight, a dog fight, anything that is exciting and that ministers to the taste that trotting gratifies. Don't stop to question its propriety after admitting races between horses. But if the object is agricultural improvement, and the encouragement of mechanic arts, pursue a course consistent with the object; be consistent even if you do not pay your bills, and either run in accordance with your name and style, or "sell out," (and I may add by appearances and fruits, I think a great many have "sold out.")

Fairs are necessary, for they give us recreation with instruction if rightly conducted. They give healthful stimulus to social life; they bring us together, and enable us to become acquainted with brother farmers from other sections. Instead of giving premiums to few persons, it would be better to divide between exhibitors; it would avoid much dissatisfaction and jealousy, and would help bear the expenses of exhibitors. In support of this, let me cite

your attention to town fairs where no premium is paid, and there we find no lack of exhibitors, or of fine products exhibited. What are these but State and County Fairs in miniature?

We want more agricultural papers taken by the farming community. Next after Farmers' Clubs we recognize their utility. Very much of the progress made in the last quarter of a century in improved farming is directly traceable to their agency. Every farmer should take one agricultural paper—better two or three—and read and heed its counsels. It is true he may not find all its counselings practicable or adapted to his circumstances, but he will weekly find enough that is that will be worth the subscription price. Frequently a little paragraph will convey a hint or a prescription worth to him hundreds of dollars during his future life. Through their medium he can ask and receive; can give and be benefitted by the giving. Through them he can learn of success or failure of others and make his own of value to others. The farmer cannot hope to thrive, in competition with others who read, if he himself does not read also. Farmers, write for and patronize the agricultural press if you would progress.

We want more young men educated for scientific, practical farmers, just as our State College at Orono is doing—head and hand. The idea is too prevalent that education and scientific attainments are not for the farm but are more appropriate to the pulpit, the bar, or the dissecting room; that they have the odor of college walls and the labaratory about them, and are symbolized by soft hands and fine clothes. And when we spend our money to educate our sons, too often we covertly rejoice that we are helping them escape from farm life, and that they will get their living easier or more agreeably than by cultivating the soil and rearing stock. We hardly can be prevailed to admit the use of education to the boy destined to follow the plow. The sooner we discard this idea the sooner we shall place ourselves in the right position. The sooner we select and educate and keep at home on the farm and in the shop our most promising children, the sooner we shall make farming what it ought to be. But, say you, do you counsel our smart young men to stay on the farm when so many other avenues are open to wealth and distinction? Yes, for no other avenue, however promising, opens up so many inducements as this. No occupation is so independent or sure as this. It is healthful—it is pleasant—it is remunerative—it is useful. It tends to long life. It brings one in daily contact with the

earth and air, vegetation and clouds, with all their varied teachings. He can study Nature in all her changing moods. He is almost sure of a living and the chances for securing a competence is much greater than in any other pursuit. No business pays better on amount of capital invested. There is no chance to gain riches suddenly, hence its moral tendency. Intelligent farming will give a sure and steady increase of wealth to the farmer. Other trades and occupations present luring attractions to the young men on the farm, but they are often illusive. Our merchants work as hard and wear out as quick as our farmers and mechanics. They enjoy less robust health and have fewer days of recreation. In all gatherings like the present, the absence of young men is a marked feature. What we are to renew the present stock of farmers with is a serious question. Who our future tillers of the soil are to be is a momentous consideration. We wish we could persuade the thousands of young men now about to leave the farm for other callings, not one-half so certain of remuneration, to remain in the ranks of the farming class. It is a sad sight to see thousands of old homesteads destitute of a successor, going to decay, because the occupant is too old to carry it on, or has passed from earth. On many—nearly all—of these families of stalwart sons and blooming daughters were raised and they have gone out from them to other occupations, or to other States, and not one, even the youngest, left to "dress and keep" the old home farm. Young men, ponder well before leaving the certainty of the farm for the uncertainty of trade, or the professions!

We want more attention to sheep husbandry, not only the keeping of more sheep than at present, but the improvement and introduction generally of better blood. Nine-tenths of the sheep of Maine—broad as the assertion may seem—are scrubs, no breeds, scranny, poor-wooled animals. We have the climate and the pasturage for the best sheep on earth, and ought to keep such. We are glad to state from observation, that this branch, which has received considerable attention in western Maine, is now receiving more in the eastern portion. It is a subject that will be hard to exhaust or run into the ground. It is one that lies near our pockets and aids our prosperity. We want, not a fine-wooled variety to the exclusion of mutton qualities, but a breed that combines wool and mutton excellence, with early maturity. The surplus lambs will be one of the great paying items of our sheep

husbandry; we have enough good blood from which to select—Leicester, Cotswold, Oxford Down, Merino, and many others. I shall not tell you which is best, for I do not know, never having tried them all. Suit your fancy, get pure bloods, keep them so, and *take care of them.*

We want more attention to fruit culture in all its branches, that can be successfully carried on in our climate and upon our soil. The cranberry should receive vastly more attention than it does. The apple is our king of fruits, yet whole towns of good orcharding lands have not a single good orchard. We can never raise, even with an orchard on every farm, too many winter apples; demand will outstrip supply, and profits increase. No region in the United States or out of it is better suited to the apple, the currant, cranberry and gooseberry, or has better facilities for production and marketing. The vaunted West, the table-lands of the sunny South may be searched in vain for combinations of circumstances that excel ours, here in the northeast corner of the union. I know that I am making strong assertions, yet I think it justified by facts. We, really, as a people do not know what a fruit country we possess. Fruit culture is at a low standard, except in a few localities, but we hope we are on the road to better days. We ought to produce millions of bushels more than we do. We can and we shall before long.

Mr. Shaw of Buckfield, set 100 New York trees; the tenth year he raised 100 barrels of fruit from them, and refused $1000 for the orchard. Mr. Ricker of Turner, raised $1000 worth of apples from twelve acres the eighteenth year from the seed. Mr. Pulsifer of East Poland has an orchard that pays about a thousand dollars yearly. There are about 70,000 farmers in Maine; suppose each had an orchard, and that they raised $50 worth of apples yearly, it would amount to $3,500,000. We might cite you to individual instances of the great value of fruit culture, in addition to those already given, but we forbear. Let every one who has an acre of land plant fruit trees. They will furnish an Eden where he may enjoy the benefits of his industry. Teach your children the art of horticulture. It will benefit them and bless you. It will spread about the old farm the strongest endearments. We are glad our fruit growers are about organizing a "Fruit Growers' Society" and that good interest is manifesting itself in fruit culture.

We want better stock than much of Maine now is. We have good blood of nearly all desirable breeds, but it is too much

confined to localities. It wants disseminating broadcast, and thus add millions in value to our live stock. We want those best adapted to our soil and climate, our conditions and surroundings. We want those that give the best return for food consumed, in milk, in flesh and in growth. We want early maturing breeds. It costs no more to keep good stock than poor, and it costs no more to keep well than to keep poor, market value considered. There is vast difference in profit between good animals and good feed and poor animals and poor feed. In addition to improved stock we want more attention to special forage crops. The more stock the more manure; the more feed the more stock; the more manure the more crops. We must keep animals for milk, for work and for beef; we must also keep them to transform our vegetable growth of hay, grain, and roots into manure to keep up the tilth and fertility of the farm.

We want to restore our old fields that are crippled by long sapping with exhausting crops without adequate returns. We want them restored back again to virgin nativity "every whit whole." Here is a problem for practical farmers, for scientific men, and for everyone. On this subject I will offer a few thoughts, and if not particularly new may serve to place them before you. There is great manurial value in old grass roots—in sward turned under by the plow. Immediately after haying plow up as much of such old field as can be handled and fertilized. Harrow down and sow on grass seed and ashes, phosphate, plaster, old manure, muck, any and all fertilizers attainable. The old sod, together with applied fertilizer, will cause a better growth than before. Repeat every few years till fully restored. A large field can be rapidly restored in this way. Save all manurial agents possible. Use muck to absorb liquid manures. Put a generous pile where the waste of the sink spout can be carried to it. Save all droppings of fowls by placing receptacles or floors under their roosts. Save and compost night-soil made on the farm with all house slops. Use loam from woods, leaves, brakes and rank growth of all kinds, not woody or containing seeds, for bedding stock and litter for hogs. In a word make, save, and apply every fertilizing agent possible.

We want more wheat produced till Maine raises her own bread. It is possible and profitable. I can refer you to eight contiguous farms in Waldo county that have produced an average of eighty bushels of choice "Lost Nation" wheat this past season. Every farm in Waldo county of fifty acres each, might have done the

same had the owners put forth a little effort. Every farm of the same size in Maine could raise the bread consumed upon it—could raise a surplus if the right course was pursued. Six hundred and fifty thousand barrels of flour are annually brought here from the west to supply our deficiency of wheat. This at ten dollars per barrel would amount to six million five hundred thousand dollars, and this might be saved at home. We should import no article we can produce just as cheaply. We regard wheat culture far less exhaustive to the lands of Maine, than potato culture.

We want our wild lands settled and developed into happy homes and productive farms; our water power utilized, making home markets; our quarries of lime, of granite, of slate, of marble and of iron, worked to fullest capacity of the market, and means of transportation. We should pursue that liberal spirit of encouragement that shall tend to this. We can band together, casting in our mites, and so help along the desired results. We can exempt from taxation capital thus usefully employed in our midst, and this would create work at home our boys and girls now go to other States to seek. We must get out of the old beaten ruts, and upon a higher, better plane of progress. Our shipyards should again resound with the notes of industry; our rivers and lakes be restocked with fish; our geological State survey be resumed, and new energy beam from the promising outlook we have. We can make our State what we will.

Contrast the agriculture of Massachusetts, of Connecticut, of New York, with ours; more instructive still, compare that of England with ours, or that of Germany. True, they have the vantage of priority of age, but with us the oldest farms are the most crippled in resources. We kill the goose that lays the golden egg,—they nourish it. We must cultivate better, use more brains in our farming, and seek the dollar through other operations then selling hay and potatoes.

I have briefly called your attention to many of our wants; that we have others, I allow. I have pointed out what I believe to be our most prominent ones, and I have called attention to some of our many resources. You, with myself, must admit that State the most prosperous which develops most of its resources, and which supplies most of its wants. We have but few wants which other States can supply as cheaply as we can supply them ourselves. We have but few resources equalled by other States. Having these vital elements of prosperity in great abundance, and

this vantage ground, we do well if we attend to their supply and development.

In this connection I would counsel an adherance to our native State. We believe, all things considered, her sons can find no superior. We believe they are as well off here as any where under the wide canopy of heaven. If they cannot succeed here where things are propitious, and where they have the vantage of education and acclimation, where they have a nativity, and know and are known, we should not want to warrant them elsewhere. Stick to Maine! She is a hardy nurse and a good mother. Here we are placed and our lot cast, and here let us live, and labor, and dying, rest from our labors amid the scenes of early youth and mature age. The West may glow with sunset splendors; her prairies spread out like fertile seas of earth, and golden promise; the South beckon us with its fields of corn and cane, and genial clime; the seasons seem repellent here and auspicious there, but trust them not. Maine is our "Home, sweet Home;" consider well before making the final move.

There is a supply for every want, and a want for our every resource. There is a reciprocity we all should seek, and a work for all to do. "Let us up and be doing while the day lasts." Bright the future will be when our giant water power is yoked to industrial usefulness, when our hillsides shall bear golden harvests of wheat, and our orchards widely extend their borders, when our sons and daughters shall turn to farming life for choice, or find ample labor and pay in our numerous shops and factories, and home markets abound. All this is actual and possible, if we but remain and upbuild.

I love my own State's pine-clad hills,
Her thousand bright and gushing rills,
Her sunshine and her storms;
Her rough and rugged rocks that rear
Their hoary heads high in the air
In wild fantastic forms.

THIRD DAY.

The Convention assembled at ten o'clock, and was called to order by the President of the Board. The first exercise was a lecture on

Farm Buildings.

BY HON. ALEXANDER HYDE, LEE, MASS.

The degree of civilization to which a people has attained can be pretty accurately measured by the style of the houses they inhabit, and the condition of the out-buildings which they erect for the comfort of their domestic animals. The savage burrows in the ground, much after the fashion of the woodchuck, or builds a mud hut, the portal of which is so low that he must convert himself into a quadruped in order to effect an entrance, and sometimes is compelled to crawl in snake-fashion. The missionaries tell us that the first step in the civilization of the Zulus is to get them off the ground. So long as they sit, eat and sleep in the dirt, they seem to be of the earth earthy, but if a Zulu can be induced to sit upon a stool, eat from a table, and sleep on an elevated couch, he begins to develop true manhood. A shirt to cover his nakedness, and a comfortable house to shelter his family, follow speedily after his elevation out of the dirt.

As wealth and refinement have increased among the nations of the earth, architecture has advanced, but history does not show a commensurate improvement in the homes of the people. Kings and princes lived in palaces and vast sums were expended on temples and other public buildings, while the laboring classes still lived in huts. Architecture, therefore, is not a criterion of civilization. We never expect to see greater triumphs of this art than were furnished by Egypt, Greece and Rome. The temples at Thebes, the pantheon at Athens, the coliseum at Rome at once attest the glory and shame of these old countries. While these magnificent buildings were being erected to gratify the pride of kings and the love of vain show among the populace, the laborers, those who erected the temples, porticoes and theaters, and those whose tilled the soil and furnished sustenance for the vast retinues of the monarchs and aristocrats, lived in miserable shanties. We never desire to see a revival of this ostentatious architecture. Great genius may have been displayed, but to what good end did it avail? Thousands labored that one might live in a palace, and tens of thousands toiled all their lives that the ashes of one might

repose in some magnificent mausoleum. Rome may boast of her palaces and her public halls, but how did the masses of her rural population live? The Romans prided themselves on their agriculture, and the patricians had large landed estates and lived in magnificent style. Columella, the most voluminous writer on Roman agriculture, gives us a minute account of a farm establishment in Italy in his day. He divides the farm buildings into three classes, the villa urbana, the villa rustica and the fructuaria; that is, the manor house, the laborers' cottages and the storage houses or barns. The mansion of the proprietor was a large, square building, constructed around an inner court with two complete suites of apartments, the one on the sunny side designed for winter, and that on the north for summer. The drawing rooms, dining rooms, bathing apartments, library and sleeping rooms were all spacious and elegant. The entertainments given in these villas corresponded with the magnificence of the mansion. Boars' heads, roast pigs, peacocks and geese loaded the tables, while Falornian wine flowed freely from the side board. Such was the home and such was the style of living of a Roman patrician. Not so lived the people, the plebians, as they were called, the tillers of the soil, who occupied what was dignified with the name of cottages, but which were little better than the negro quarters of our late slave holders.

It was not till the Puritans landed on Plymouth sands, that the true idea of homes for the million seems to have taken possession of any community. The Puritans had their defects, but they were stern democrats in the etymological sense of the word, having full faith in liberty and equality. With all due deference to their rulers, they believed that the workers had some rights which magistrates were bound to respect, and among these were the rights of owning soil and building comfortable houses thereon. To their influence New England owes the distinction of having a rural population that own better homes and live in better style every way, than any other agricultural people on the face of the earth. The English nobility, the great land lords of that country, are astonished as they come to New England, to see the multitudes of proprietors of small landed estates, and more especially to see the houses they occupy, and the general style of living which they adopt. One of these English noblemen on a recent inspection of some of the farm houses of New England exclaimed, "Why! all your farmers are lords and live like nabobs." A

farmer in England is a tenant, a lessee and cultivator of the land of some great proprietor. New England has greatly the advantage over the mother country in this respect. A New England farmer owns his land in fee simple, feels an interest in its permanent improvement, in the erection and support of suitable farm buildings, and in the general welfare of society around him. That country is doubtless most happily circumstanced for all family, social, literary and religious privileges, where the land is divided among small proprietors, when in every one or two hundred rods, a comfortable farm house with convenient out-buildings dots the highway. Wherever you find these frequent tidy homes of the tillers of the soil, there you may be sure to find also the schoolhouse, the church, a good neighborhood and all those social institutions which tend to develop manhood and give a charm to life. Such is our favored New England. We have a cold climate, a rough, rocky soil, for six months in the year we are obliged to house and fodder our cattle, and for twelve months must labor industriously to make our ends meet, but in no other country can be found so many and such comfortable homes, or a higher degree of intelligence and refinement in the moral population. But superior as are the mass of our farm buildings to those of other nations, there is a margin for further improvement, and our object is to throw out some suggestions by which the condition of our families, flocks and herds may be bettered.

The farm buildings of New England may not be divided into three classes, as were those of old Italy, for we have no place for laborers' cottages or shanties. We trust the day is far distant when the farm owner will not be the farm worker. Our farm buildings, therefore, are simply divided into the home for the family and the shelter for the stock, the former including all the appurtenances necessary for the comfort of the household, and the latter all the accessories of a well appointed barn. Of these two classes of buildings we need not say that we put the house first. We have heard of some farmers, and in fact have known some, in whose estimation the horse seemed to be first and the wife second, who labored indefatigably for the comfort and thrift of the barnhold, and were careless of the wants of the household, and who preferred the air of the stable and the society of the dumb animals to the more manly duties and pleasures of the family circle. If any one is present who feels more at home in the barn than in the house, him shall we offend by making the house the first of farm

buildings. In Pennsylvania they have this maxim: "A farmer is known by his barns," and they practice on this principle, for the traveller through the Keystone State can not but notice, that while the barns are spacious stone buildings, the houses are often little squat affairs. On a close inspection it will be found that the stock have more done for their thrift and training than the children have for their comfort and education. The ignorance of some of these big-barned little-housed farmers is so great that some one has said that they still vote for Gen. Jackson at presidential elections. A true New Englander places the house and family first, the barn and stock second.

The first suggestion that we wish to make in reference to the farm house, is that more judgment be exercised in the selection of its site. As we pass around the country we notice many houses located on low, damp, marshy places, where no prospect pleased and where the malaria from some neighboring swamp must overload the air with the seeds of disease. The Hoosier and the Sucker may plead necessity for building their houses in the mud, and laying a plank walk to their barns in order to avoid being swallowed alive like Korah and his company as they pass from one to the other, for high and dry building sites can be found on few prairie farms; but the Yankee has no such excuse for locating his buildings on low, damp and unhealthy situations. A prairie farmer once said to us, "I would give a thousand dollars for one of your New England gravel knolls on which to build my house," but here, where dry knolls abound, they are too often neglected in selecting a building site. The excuse for locating farm buildings in low, damp places is a desire to avoid bleak winds, but the pure, dry air, cold though it may be, which plays about the summit of a hill, is not half so much to be dreaded as the damp, malarious atmosphere of the more sheltered valley. The fogs which infest the low lands are more chilling and pernicious in their influence than the dry winds of the hill. We have often noticed in riding over our hills and through our valleys of a summer or autumn evening, that while the air on the high lands might be brisk, it was warm and dry compared with that in the valley. As we have descended into the latter the transition was as marked as on going from an airy chamber into a damp cellar. It is not necessary that the valley should be marshy in order to perceive this difference in the dryness of the air. We have often noticed it in descending

from the hills into the valleys of the Connecticut and Housatonic, where the land of the valley was a dry alluvial.

It is a mistake to suppose that the hill is colder than the valley. Every farmer must have noticed that the late frosts of spring and the early frosts of autumn do more damage on the low lands than the high lands, and the thermometer of a cold, still night, shows a lower degree of temperature in the low lands. The valley may furnish a shelter from the winds, but not from the cold. Cultivate, therefore, the valleys, but place your farm buildings on the hills where an equally good shelter from the winds can be secured by clusters of white pines or other evergreen trees planted on the windward side of the buildings.

As a second suggestion we say, locate farm buildings where the sun will shine the most hours of the day and the most days of the year. The value of sunlight, both for man and beast, has never been fully appreciated. There are life, health and elasticity of spirits in sunshine. Show me a woman that has worked for years in a dark, gloomy cellar kitchen, and in all probability you'll show me one the corners of whose mouth are turned down, whose constitution is impaired, and who has lost all buoyancy of feeling. Show me an ox that is stalled in a dark cellar stable and yarded on the north side of a barn, and I will show you one whose eye is dull, hide inelastic, hair bristling, and step heavy. Physicians tell us that patients located on the south or sunny side of hospitals are more likely to be cured than those on the north side, and heliopathy is as much in fashion as hydropathy once was. What the exhilarating and invigorating effects of a sun bath are, we can conceive from the change that comes over our feelings and powers, when the sun shines out clearly after having been hid for a long time behind the clouds. Women and cattle require that the farm buildings should be located where the sun's influence is felt more than man does, for his business calls him into the sunlight for the greater part of the day. What a blessing it is to have the rays of the sun pouring upon him constantly, man seldom knows till he is deprived of it. We have seen a prisoner just coming out from a long confinement in a penitentiary, and we well remember the expression of delight that came over his pale face as he breathed the free air and with his bare head stood where the bright sun shone directly upon him. His first exclamation was not on the pleasures of freedom, but, "Oh! this glorious sunlight!" The farmer who compels his wife and daughters to work in a damp

cellar, or in a kitchen where the sun seldom shines, deprives them of one great source of health and happiness. No man should make a penitentiary of his home.

As a general rule the house should be located on the north side of the highway and, if possible, on the south side of some sunny slope, where the sun's rays will strike it early in the morning, and late at night, and should be so arranged that the living rooms should be full of light and life. Much sickness and many heavy doctor's bills can be avoided by large daily doses of sunlight. City ladies sometimes have great dread of the sun, fearing lest it may spoil their delicate white rose complexion, or fade their carpets and curtains, and so they keep their blinds closed and live in a "dim religious light," as it is called, though we never could see any connection between religion and darkness. City life is highly artificial in most of its aspects, and if city women prefer darkness to light, fashion to comfort, it is their privilege so to do. They pay their money and may take their choice, but we expect wiser and better things of our rural population. With all due deference to the more refined taste of city ladies, we prefer to see women whose cheeks have the color of the old-fashioned damask rose, and this color can only be secured by a free exposure to sunlight. Refinement, polish and delicacy may all be very well, but it is possible to carry these things so far as to eliminate health of body, vigor of intellect and simplicity of manners. We never desire to see our country women so polished and refined that they will lose all the characters of a strong, vigorous womanhood. One of the rights of woman, and one more essential to her happiness than suffrage, is the right of living in the sunshine.

Very nearly allied to the location of the house where the family may enjoy the full benefit of the sun's rays, is our next suggestion that the house be not surrounded with too many shade trees. A tree is "a thing of beauty and a joy forever," and we would by no means discard all trees around the farmer's premises, but it is possible to have too much of a good thing. A house without any shade trees looks naked and is naked. A few well located elms, maples, mountain ashes and white pines add much to the beauty and comfort of home, but no one should live in a forest. Musquitoes may live and thrive in such a dense shade, but man finds his true development where air and light find free access. We never desire to see so many trees around a house that the grass will not make velvety a turf on the lawn. Beautiful as are trees

and exquisite as are the forms and colorings of flowers, there is nothing that pleases the eye more, day after day, than a well kept lawn. A stately elm here, and a cluster of evergreens there, adorn and protect a rural home far better than a perfect swamp of trees.

We cannot dismiss the trees without alluding to the protection from winds and the healthful influences which evergreens rightly planted furnish in this cold climate. Clusters of balsams and white pines placed between the house and barn, and pig pen, to ward off all noxious effluvia from the latter, and if there is any swamp near the premises, the same trees, with their millions of leaflets, will absorb or turn aside the spores of disease which are constantly exhaling from decaying vegetable matter. Planted on the north of the house and garden, which is generally the windward side, evergreens not only protect from the cold winds, but they fill the air with a most healthful balsam. Consumption, the great scourge of New England, finds its most effectual antidote in the aroma from our common white pines.

One word about the ventilation of our houses. We talk about bread as the staff of life, and food as the great supporter of the body. We cannot live long, surely, without food. We must take it two or three times a day or our strength fails, and we waste away to mere skeletons. But we cannot live without air a moment. A healthy man makes twenty-five to thirty inhalations of this vitalizing fluid each minute, and if from any cause the air is withheld from the lungs, he ceases breathing and ceases to live. If to any extent the air is contaminated, just so far its vitalizing power is destroyed. If it has been once breathed, it is unfit to be breathed again till it is reoxidized. We look with disgust at "the dog that returns to his vomit," but breathe the air that has just parted with its oxygen in another man's lungs, without any other feeling than that of languor and dullness. Consequently in a close room, with a few persons in it, the air soon becomes contaminated, and all the sooner if the room is heated by air which has passed through the hot chamber of a furnace, where it has already parted with some of its oxygen. The prisoners confined in the horrible Libby dungeon at Richmond, tell us that no one, without trial, can conceive the sufferings they endured from the want of pure air. The ceilings were low, they were huddled into the rooms much as sheep are folded, and did not dare to approach the barred windows

for fear of being marks for the hostile bullets. Libby prison furnishes an extreme case of contaminated air. In the tight rooms of our houses, we do not see sickness and death following so closely as a consequence from impure air, but they follow none the less surely. The open fire places by which our fathers sat, were great consumers of fuel, but they furnished a most perfect ventilation. The open Franklin stove and the open grate, also permitted a constant rush of air up the chimney, but upon the introduction of furnaces and close stoves, a veto was put upon the circulation of air in our living rooms.

The matter of ventilation is one which has been mystified, but its principles are simple, and thorough ventilation of our houses and barns is much more easily secured than thorough drainage of our lands. The governing principle in ventilation is that air enters at the lower orifice and passes out at the higher. This is as universal as the law of gravity, which makes water run down hill. The chimney being the highest tube, is therefore the natural outlet of the air of the house, and all we have to do in order to secure good ventilation, is to make an opening from the cellar and from each room into the chimney. The air will be found constantly rushing through this opening up the chimney, and leaking in through every crack to fill up the vacuum. If double windows are used and the rooms are very tight, it may be necessary to let fresh air in through a tube, furnished with a valve so that the amount may be regulated just as we regulate the amount of air which we let into our stoves.

As a final suggestion with reference to farm houses, we say, build them at least two stories high. Our fathers, from some unaccountable reason, built many of their houses with posts eight or nine feet long. Possibly they were governed by motives of economy, or thought that ground-floor rooms were more convenient. Whatever the reason, they made a mistake. It costs but little more to build a house with two stories than with one. The foundation costs the same in either case, and the same shingles which cover one story will cover two. It is something of a tax on muscles to ascend to the second and third stories, but when we get them, we find more airy rooms, and preferable in every respect, especially for sleeping, as they are further removed from the exhalations of the cellar and the dampness of the earth. The better lookout on the face of nature is no poor compensation for climbing a flight of stairs. No one who has tried living on both ground

and second floors will prefer the former, unless he is so foolish as not to know the difference between good air and bad. A story and a half house is but little improvement on the one story. We never see one without some four-pence-half-penny association, and we never get into the low chambers without a desire to get our shoulder under the roof in order to raise it a few feet.

We would like also to suggest that the house be not located close by the road side, exposed to the dirt, noise and inspection of every passer by, but at such distance from the highway that the original idea of home, (a close, sheltered, retired place, the old Saxon word *ham* signified,) might be carried out. A green velvety lawn in front of the house will ever make a green spot in the memories of our children and allure them to the home of their youth. Did time permit, we would like to insist upon placing a well lighted and well ventilated cellar under the whole house, and thus furnishing a stable foundation for the whole, and ample storage room for fruits, vegetables, etc., but we must omit these and other points, and consider briefly the second class of farm buildings, the fructuaria or store houses as the old Romans called them, barns or storage houses for barley, as our Saxon fathers named them, with whom barley was the chief grain raised. In our vigorous northern climate we use barns not merely as places of storage for grain and hay, and other forage, but as a shelter for our herds and flocks, so that, as the house is the home of the family, so the barn is the home of stock, and therefore many of the suggestions we have made as to the locality and ventilation of the house, apply with almost equal force to the barn. Do men thrive when supplied with fresh air, pure water, nourishing food, good shelter, warm clothing and comfortable bed? So do the flocks and herds.

It must be confessed that much less attention has been paid to barn, than to house architecture. The climate of northern and western Europe is so much milder than that of New England, that large and tight barns have not been the glory of English, French and German farmers; and when our fathers, especially our English fathers, first landed on these shores, they brought with them the customs of the old country, where they make large stacks of hay and grain, and feed their stock largely out of doors. When convinced that barns were necessary in this cold climate, they built them on the surface of the ground, with loose stones for underpinning, and large cracks between the boards used for siding.

Such barns had one good quality, thorough ventilation, but with it too much refrigeration.

The old fashioned New England barn, 30 by 40 feet in size, sometimes 40 by 50, and more rarely 40 by 60, with 14 to 16 feet posts, a barn floor running transversely, on one side of which was the mow, and on the other stabling with a scaffold above, with a mere apology for underpinning and no apology for windows, has pretty generally given way with progressive farmers for a barn in the form of an elongated parallelogram, with a cellar under the whole, a floor running longitudinally the whole length, with large doors at either end, and well glazed stables on the sunny side and bays for hay and other forage on the north side. This is the general outline. The details vary with the varying wants and tastes of different farmers.

A few years since we were appointed on a committee to draw a plan of a barn for the Massachusetts Agricultural College farm, and to post ourselves up on this point visited the most famous barns in the State, and some out of the State, and became satisfied of one thing, that it is with men's barns as it is with their watches, no two agree, but each one thinks his own the best. If farmers can only agree on general principles, the essentials, as the theologians say, it is all that we have any right to expect.

In our examination for a plan of a model State barn, we were struck with this fact also, that few architects have made barn architecture a special study. Most of them can tell us how to erect a Gothic or a Romanesque church, a Grecian or Italian villa, can talk learnedly about the Corinthian, Doric and Ionic styles, but when we ask them for a plan of a barn, their answer is, "Oh! we don't know much about the lower class of buildings." This only shows that the comfort of beasts and convenience in the care of them are subjects of modern investigation. We are glad to know that they are securing increased attention.

It may help in our study of barn architecture to have clear ideas of what we should aim at in the construction of our barns. As we understand them, the four principal things to be considered are, commodious storage for crops, comfortable quarters for stock, economical manufacture and saving of manure, and convenience in the performance of barn work. So far we shall doubtless all be agreed, but in arranging the details for storage, comfort of stock and convenience of labor, we shall probably be compelled to agree to differ. We have been in barns that were so complicated

in their structure, that we felt that we were in a labyrinth and needed some pilot to show us the way out. We have one barn in Massachusetts costing no one knows how much, but estimated all the way from $40,000 to $100,000, which is at the same time a barn, saw mill, grist mill, farm house, granary, dairy room, carriage house, pig pen, hennery, in short, a multum in multo, which means in plain English a big thing. Certainly it is a big failure. A learned professor in one of our colleges after having looked it over carefully, gave this as the conclusion of his observations: "I see but one thing lacking in this barn, and that is, there is no library in the pig pen." The lesson from this barn is, study simplicity in all the arrangements of the barn. We believe it is Milton who says "Woman is most adorned when adorned the least." Certainly that barn is best arranged when, other things being equal, it is most simply arranged.

To go a little more into details. We are great advocates for barn cellars as giving a sure foundation to the building and furnishing the most convenient place for the deposit and manufacture of manure, but not as a stabling place for horses, cattle, sheep, or even swine. Men may love darkness rather than light, but the dumb beasts do not. They love to bask in the sunshine. Even the mud turtle, that we should suppose would of all animals, be most inclined to the ways of darkness and filth, delights to get upon some rock or log of a sunny day and let the sun pour upon him its life giving influences. We have tried keeping hogs in a cellar where they might eat the refuse of the horse manger and stable, till we are satisfied that a dark cellar is as uncongenial to a hog as it is to a man. They may be allowed to run into the cellar occasionally for feeding purposes, but it is poor economy to make them eat and sleep on a manure heap. If hogs can not breathe with impunity the air arising from fermenting manure, much less can animals of a more delicate organization.

A neighbor who had accumulated quite a fortune from a large farm and hard work, determined a few years since, as he had become somewhat advanced in years, to build a barn in which labor could be facilitated, cattle kept warm and manure never should freeze. He accordingly built a spacious stone barn on a side hill, having access to the barn floor, which was just below the plates, by means of a wharf built on the hill side. Of course he needed no horse pitch-fork, for he pitched his hay into deep bays on either side of his barn floor. His forty or fifty cows

were stalled in long lines on either side of the basement, with their heads to the wall and their excrements were thus thrown out very conveniently into the wide space between the rows of cattle, from whence he thought he should draw it out as the leisure of winter permitted. Winter however furnished less leisure than he expected and the manure lay and fermented and the cattle inhaled the impure air. It was rumored before spring that M——'s cattle were sick and dying, evidently with some lung disease, and it was feared with pleuro-pneumonia. The State Commissioners were called to look at them, who decided that the disease was pneumonia, not the contagious sort imported from Europe, but generated from the foul air of the basement stables. The lesson from this barn is that we must study the health of our stock as well as their warmth and our convenience in their case. It may be possible to light and ventilate basements so that cattle may be stalled in them without damage, but as a general rule we prefer to put them on the first floor above the cellar, on the south side of the barn, where abundant windows may let in light and heat. We do not keep our children down cellar, for they would grow white and puny, as does a potato vine that grows in the dark. For the same reason a calf kept in the dark may make very white veal, but not a stout, healthy ox.

It may be asked, "How can we ventilate our stables and keep the air pure and sweet?" It is a difficult problem and one rarely solved. The stable seldom smells like a bed of roses, and the stable boy is rarely fit to sit at the table with ladies, whose olfactory nerves are at all sensitive, till he has changed his clothes. We have no chimney to barns as a general rule and therefore no such convenient mode of ventilating them as we have in our houses. The thing next best to a chimney is a tube running from the basement and the stables to the roof. If the barn is large, several such tubes a foot or fifteen inches square will be requisite. Up these tubes the air warmed by the fermenting manure, or the heat of the animals, will be constantly rushing, as it rushes up a chimney, seeking the highest outlet. If two tubes be introduced into the stable, one having a lower orifice than the other the air will enter through the lower one and pass out through the other. In all cases where manure is stored away in cellars over which horses or cattle stand, ventilating tubes must be introduced, or disease will introduce itself. It may insinuate itself very slowly and possibly imperceptibly, but it is impossible for noxious offences

not to come in such cases sooner or later. The disease may not always attack the lungs. Like the attack of a besieging foe, the blow is generally struck at the weakest point, whether this is the head, heart, lungs or liver.

There are many other suggestions which we would like to make did time permit, but we fear we have already tired your patience, and will close with a precept given to us in our youth by an old farmer: "Concentrate your out buildings as much as possible under one roof." We see around some farm houses a conglomeration of out buildings, a big barn there, and a little barn there, here a shed and there a shed, standing as thick as nine pins on a bowling alley. "It costs money to support shingles," said the old farmer, "and you must therefore make one shingle do as much execution as possible."

We glory in the farm houses of New England. They are the homes of competence, contentment, intelligence and virtue. The French language has no synonym for our good old Saxon word *ham*, anglicized home, which is to an Englishman and a New Englander the dearest spot on earth, where if anywhere, he has a foretaste of the joys of heaven. If we have said one word by which this home may be rendered more delightful, our labor has not been in vain.

THE PRESIDENT. The question is now open for discussion, and I will call upon President Allen of the Agricultural College, to favor us with some remarks upon it.

PRESIDENT ALLEN. Perhaps the President is right in calling upon me. I presume I have lived in as many houses as almost any other man here. An itinerant preacher for more than a score of years has had a chance to try a variety of homes, and knows by comparison something of the advantages of a properly located house. A single incident in my own experience will illustrate the value of a sunny house. I am not now exactly of consumptive shape, but when I first commenced my professional life, I was a candidate for consumption; in fact, I had consumption. Two of my brothers had died of that disease and my complaints were of a consumptive character—pain in the side, a hacking cough, bleeding at the lungs, night sweats, and all those horrible symptoms of almost immediate dissolution. Somehow or other I outgrew it, threw it off. After I had been preaching some time, I had to go to a physician. He was one of those common-sense men, who do not merely give medicines, but give advice, and he

said to me, "Tell your wife to open the blinds, roll up the curtains and let in the sun." I said, "There is no need of any blinds on the tenement where I am living; it is on the north side, and no sun comes there." "Then," said he, "get another house." I said, "I am a preacher, and that is the parsonage." "Tell them to sell it," said he, "if they don't want to kill the preacher. Don't you stay there. You won't live a year there." Well, I did not go home immediately, but I sent word to the parish what the doctor said, and they, rather than kill the preacher, just at that time, got a new parsonage before I got back,—a sunny and good one, too. I believe that it is absolutely essential, if we are to drive away that terrible scourge of consumption, that our homes shall be sunny homes.

Another thing. I have been in a home in the city, where there was a good chance, naturally, for the sun, but the shade trees grew up thick. I contrived sometimes to get them thinned out marvellously. There are various ways. Sometimes trees die—*accidentally*. I never resorted to any such expedient, however; never had to; but I have known some who have done it. In some of our cities, in the most beautiful streets, the homes are unhealthy from the superabundance of shade. I believe in a sunny home, and I would rather have an old faded carpet than to have the sun excluded, or I would rather do without a carpet entirely and have the sun. I like blinds on a house, because in the heat of summer, we want to be able to shut out the sun. Too much of a good thing is good for nothing; but I do not believe we ought to live in the shade.

There is another thing I have learned. I believe in having a good sunny room for a bed-room; a room that has been sunned during the day. I do not believe in sleeping on the north side of a house. I intend to take the best room for my usual sleeping-room. The room on the north side will do for company; they only come occasionally. You know you must all have a parlor, that must not be opened except semi-occasionally. That may as well be on the north side. The living rooms should be on the sunny side. I believe in what the speaker has said. I am glad he has presented the subject so fully, and I only wish to impress upon you, if I can, the importance of these good, sunny localities.

With regard to shade trees, there is one beautiful shade tree which has not been alluded to, and it is one at which I suppose some of you will smile if I mention it. It is the hemlock. I do

not mean the hemlock as commonly seen, which is a rough and awkward looking tree, but the hemlock, which under favorable circumstances grows up very graceful, with its splendid spray, and beautiful silvery leaf, playing in the wind,—one of our most beautiful shade trees. I think that spruce would be about as good for shelter here as white pine.

With regard to barns and farm buildings, I do not know enough about them to express any opinion. I presume the suggestions of the speaker were as correct and appropriate on that matter as on the other matter, about which I do know something, and that is the house. Oh, the good, beautiful home! A cheerful, happy home, with its attractive surroundings,—it is that which will make the children better. A part of my soul's heritage are those associations with the old familiar home; that home, with its beautiful grassy lawn; that home, with its magnificent elms; that home, nothing costly, nothing expensive, simple in its architecture; but it is *my* home,—my father's house,—the old place. I go back to it, and through all the wanderings of life, I have found no other spot which could compare with the early home. But that was a sunny home,—a beautiful place. The living rooms were those where all around was beautiful; the aspect such as makes it recognized at once by every passer-by, as a beautiful spot. I think that our State is full of those beautiful localities, unoccupied, unimproved oftentimes, when inferior positions are chosen for the family home.

Mr. Payson of Westbrook. We sometimes regret that there is such a thing as contagion in this world. I suppose there is not a gentleman here who has not suffered from it through the last disease that prevailed among our horses. But if you will notice, gentlemen, you will find that there is almost always, in this world, one thing set against another. A thing that produces a misfortune is also charged at the same time, with the duty of conferring a benefit. I felt the truth of this as I listened to the gentleman who has so pleasantly and with so many instructive hints addressed us this morning. I have caught the contagion. I did not believe that so much could be said in so short a time to which I could listen with so much interest. It has been the same, gentlemen, I have no doubt, with every one of you.

I must confess that I never belonged to an agricultural club. I have rarely attended an agricultural meeting, (more shame to me,) and I came here not believing that I should carry home one single

fact that I did not know when I came here. How am I condemned as I stand here to-day, having listened to this gentleman, and having gathered other instructive facts from this convention! How do I stand condemned, having come here with such a skeptical, unbelieving temper! But to the point. I have one claim to address this meeting which no other man in the room or in the State has. I presume no man in the State has been guilty of so great a piece of folly as I have. I presume I am the only man in the State who was ever foolish enough to build a house to live in with bricks that were not burned. I attempted that experiment, and if I had more time, I could amuse you, at any rate, by giving you an account of that experiment, which began some twenty-five years ago, and carry you along through the process, and show you the embarrasments I have suffered, but time does not permit. I merely wish to confirm a single remark made by the gentleman, in reference to the selection of a site for your dwelling house.

I went on to a farm some twenty-five or thirty years ago, knowing as much as this about it, that a neighbor of mine, in speaking of myself and brother, whom I unfortunately, and I think wickedly, induced into it, spoke of us as "two fools, who didn't know as much as two yellow dogs." And I must here remind you of the anecdote, which you have often heard, of the man who complained to a friend that another person had said something about him that was very disparaging. "Oh," said his friend, "never mind that, you will outlive it." "But the trouble is," said the other, "it is true." Now, there was a great deal of truth in what the old gentleman said of myself and brother. When we went upon the farm, we literally, both put together, did not know enough to compare us with two respectable yellow dogs. Well, one of the foolish things that I did (which shows that I am justified in saying what I have, and that I am not parading an imaginary folly here,) was the building of the house to which I have alluded. But I had some common sense, at least, and against the advice of all my neighbors, I set my house on a hill. I have found, gentlemen, that if anybody is very much burdened with advice that he wants to get rid of, he almost always goes to some poor farmer and gives it to him; farmers are the general receptacles of any extra advice that is lying around loose, and that nobody knows what to do with; and my neighbors, (knowing that what the old gentleman said was true, or possibly believing what they said,) came to me and said, "Don't build on that hill,"—which was the only hill on

my farm; and they pointed out beautiful spots, as they said, at the foot of the hill, and near the water. I said, "I have a very fine view here, and I can set out trees, and protect the house from the winds." They said, "You will get tired of the view in twelve months." But I went on and built my house, and let me tell you how erroneous that gratuitous advice has turned out to be. That view has never lost its attractiveness. It is worth more to me now, after having lived there twenty-five years, than when I went there, and I have no doubt it will constantly increase in value. I can only say, that I endorse fully what the gentleman who has addressed you so eloquently on that point has said.

Mr. M. J. METCALF, of Monmouth. I want to say a word in connection with this subject of farm buildings on a point which has not been touched, I believe, in the discussion. I agree with all that has been said in reference to the influences that a beautiful home, with pleasant surroundings, and an abundance of sunlight and air, will have on the family, in the sweet remembrances which are cherished of such a home and the inducements which it furnishes the children to return to it, as well as in the real benefits and attractions connected with such surroundings and such buildings; but I am going to speak of another thing.

I am not a farmer, on a very large scale, although I am interested in farming, and always have been. I am in love with it, and try to keep myself posted up in regard to it. We ought all of us, whether engaged in the practical business of farming or not, to be interested in agriculture, for it is that which sustains us and the world. We want, as farmers, everywhere over the wide country, to interest our children in the farm and keep them at home; we want to make home attractive to them, and to perpetuate the advantages and privileges of the farm to our children, our rightful heirs. Now, it should be the aim of every religious man to keep his children under religious influences, from babyhood up through youth and manhood. There is an interim when, I suppose, parents hardly hold that influence over them. There comes a time when young men think of going abroad and looking out for themselves, and very often to the regret of their parents, they go away, and fare worse for going away. Now, how can we add to the interest and attractions of the country and thus keep our children at home? We must allow them all the privileges we can, without injuring them. Allow them to work out as little boys; give them land, and give them opportunities to earn money

for themselves; make them one with us to some extent, in this interest.

But I have been a long time coming to the point, and that is this: have a farm workshop, with its tools and its opportunities for useful work. Keep it warm in winter, and repair your farm implements, manufacture your farm implements there. Interest your boy in the work, and it will be of value to him in all his after life, whether he remains upon the farm or not. He will imitate whatever he sees in the way of machinery, and use it on his land. I say, then, let every farmer have a tool-shop, be systematic, and teach his boys to be systematic, and they will be systematic when they grow up to be men.

Hon. J. B. WALKER of Concord, N. H. I agree with Mr. Hyde in the admirable suggestions he has made in regard to farm buildings, and partially in what he has said with reference to the barn. I must say that I have derived a great deal of pleasure in my barn. I do not know anything more pleasant than to go out into the barn with a pitchfork when your cattle are all housed and comfortable, and have good appetite, and walk up and down and see that they are well fed. There is a pleasure in this; and while I would not say one word to exalt the barn above the house, still, I want to say a few words about the barn.

Mr. Hyde spoke of ventilation, and that is of very great importance, in my opinion, and I have come to that conclusion very much as my friend Payson has come to the same conclusion—by making mistakes. I had a barn which was built a good many years ago, and in that barn I kept my stock. In the course of time, some fifteen or twenty years ago, I was notified by a railroad official that he proposed to run his railroad within a very few feet of my barnyard, which would necessitate the moving of my barn. I thought I would improve my barn when I moved it, and among other things, that I would make it tight, so that the infernal steam horse should not rain his sparks into the barn through the cracks. I clapboarded it, made new doors, put in new windows, and made it as tight as I possibly could. I had pretty good crops the next fall, and I filled the bay on one side, the scaffold on the other, and the flooring overhead, with hay and corn-fodder, and when winter came on, I introduced my cattle to the barn. I had perhaps twenty-five head of cattle in that barn. They occupied the whole of one side and a portion of the other side. Well, pretty soon it came on cold weather, similar weather to what we have been

having for a few days past, and upon going into the barn, I found I could hardly breathe; and on looking round, in the course of a day or two, I found that the entire roof of the barn was covered with frost from an eighth to a quarter of an inch thick. Thinks I, "I have made a mistake, and everybody will laugh at me." Then it occurred to me that the barn wanted ventilation, and the next season I got some carpenters and went upon the roof and made two large ventilators. I supposed I had cured the difficulty and should have no further trouble. But when the next winter came I found I had the same trouble, although not to the same degree. I found that whenever a thaw came this frost that had collected on the boards in the roof of the barn, would melt and run down into the hay and wherever the hay came against the boards, it would be ruined to the depth of three or four inches. I felt cornered—as a man feels when he is beaten; when he is in a slough and does not know how to get out. But all of a sudden this idea came into my head: If you are going to ventilate a jug, can you do it by taking out the stopple? No, sir. If you are going to ventilate that jug, you have got to knock a hole through the bottom, and then you will get a current through." I acted upon that simple thought. I do not say that it was an inspired thought, but it did a good deal for my barn, and it flashed upon me in an instant. Then the question came, where I should make the opening for ventilation. I thought I would put it right behind the hovels, as the most convenient place; but it occurred me that if I did, the air would pass over my cattle and chill them, and if I wanted to keep them up to a given amount of flesh, I should have to feed them more than I had to keep them warm. Finally, it occurred to me that the best place to have the inlets for my air was right in the barn floor, and accordingly I went to work and cut some holes in the barn floor, so that the air could come in from the bottom, and pass, not over the backs of the cattle, but near their noses where they wanted it, and diffuse itself all over the barn. The result has been perfect ventilation. No more gathering of moisture overhead; no more chilling of the cattle; and on going into that barn in the morning, although it may be full of hay and the breathing space comparatively small, the air is almost as pure as in the house. There is none of that hot, dead, unhealthy air that I used to have before I got this ventilation.

One word in regard to ventilation. I had occasion to be upon a committee to see about building a barn, and this important question of ventilation came up. I was told that the best place to put the ventilating shafts was in the hovel behind the cattle; and I was also told (and we had the thing in practical operation, and it worked well) that by putting up a chimney or tube, with a partition in it, while one current of air would go up another would go down; that one would neutralize the other and it would not be likely to chill the cattle. We tried it. The barn was 110 long and three or four ventilating flues were put in. It did not work as we expected it would. The consequence is, that at one point in that barn, there will come down a large amount of fresh, cold air, and at another point a large amount of hot air goes up. My impression is that your inlet better be where the current of fresh, cold air will pass over the noses of the cattle, rather than over their backs.

One word more, and then I have done. I infer from what Mr. Hyde says, that he is fully alive to the importance of so constructing our barns as to shelter our manure. We lose a great deal from the washing of manure, when out of doors, as well as by evaporation. My experience has led me to the conclusion that we want a tight bottom to our manure receptacle, as much as we want a tight roof overhead. This old barn to which I have referred taught me a lesson in regard to that. When I raised that barn, to put a cellar under it, I saw that the earth underneath looked damp and very rich, and I dug out and put away as manure all that had the slightest tinge, showing that it had been colored by the manure that had soaked through the floor. I have no doubt I had lost for years quite a quantity of valuable manure in that way. But when I got down to the clear sand, as white as the sand on the sea shore, I came to the conclusion that that was not good for anything, and I used it to grade up around my house, intending to spread some soil over it, in order to make the grass grow. Very much to my surprise, this sand that I had taken from two and a half to three feet below the surface, that was entirely barren, as I supposed, threw up a rank growth of barn grass, that lasted one year. Thinks I, if it will bear barn grass, I will wait and see what else it will bear. That barn grass went out the next year, and up came a growth of witch grass; and from that day to this, fifteen years or more, that ground has grown witch grass every year, without a particle of manure.

What does this show? It shows that these fertilizers, particularly liquid manure, go down further than we have any idea of, and that we are losing more every year than we are aware of, by not having it in the bottom of our barn cellars. Consequently, when building this barn to which I have referred as one that I happened to be upon the committee to superintend, we went to the trouble of making a perfectly tight floor for the manure to rest upon. The result has been, that the manure made by the cattle in that barn has to be cleared out three or four times a year. You will find, if you have such a cellar under your barn, that you will have more water than you know what to do with, and you will be obliged to throw in absorbents continually to mix with that manure, and the amount you make will probably be double what you will have if you let the urine soak away into the soil.

When the gentleman who read the paper last night spoke of emigration as operating to the discouragement of farming in Maine, and of the importance of keeping the boys at home, I was reminded of an old story. A traveller was going through one of the towns of New England, and came to a large house that had evidently never been painted; the clapboards had got black, the nails had stated out of some of them, and they were settling down, and hanging by the nails; there was an old-fashioned barn, boarded up and down, with large cracks that you could run your hand through, and everything about the premises had a dilapidated and untidy look. He met a boy, and said he, "My son, whose house is that?" The boy looked rather cheap; "You mean that house, there?" "Yes." "That is my —— yes, sir, that is Mr. Smith's house." "Thank you," said the traveller, and passed on. Pretty soon he came to a house the exact opposite of this; just such an house as Mr. Hyde and President Allen have spoken of, with a sunny outlook, and where everything looked prosperous and thrifty. He thought he would ask the next boy whose house that was. Presently he met a boy, and he said, "My son, can you tell me whose house that is?" "That is father's house; that is where I live." What was the result? The first boy went off to a city, and got so he could drive a hack; the other boy staid at home, followed in the steps of his father, became a solid and substantial citizen, and stood up for the dignity and importance of the great interest to which we are devoted—farming.

PRESIDENT ALLEN. I would like to ask Mr. Walker how he

prevented the exhalations from his barn cellar, with that tight floor from passing up through and tainting his hay.

Mr. WALKER. In the first place this tight floor is upon the south side of the barn, and a good portion of the year, when it is not too cold, the windows are kept open, and you get a free circulation of air underneath the barn. Then in the coldest weather, when the windows are closed, the ventilating tubes carry off these exhalations. Very little trouble has arisen from this cause, and yet, in order to be entirely frank, I will say that in the coldest weather when the barn is closed, you will perceive some of these exhalations, but not enough to be very noticable. I think the objections to this plan are less than we should find attending any other.

Mr. PERLEY of Naples. I have listened with a great deal of interest this morning to the lecture which has been addressed to us, and I must say, that while full of thought itself, it sets any one who has thought to thinking in various ways. One does not feel that he has time, while such a lecture is being read, to fully appreciate it. Involuntarily the thoughts of the lecturer carry the thoughts of the hearer off in another direction and he cannot help losing part of it.

While the gentleman was speaking in regard to the location of our houses, an illustration which goes to confirm his statement came into my mind which came within my personal knowledge. A certain farmer in York county, on the banks of the Saco river, had a house that was situated about fifteen rods from the river, and elevated some twenty or twenty-five feet above the river. It was a farm which had passed from hand to hand. Whoever lived there seemed destined to sickness or death. Several parties, either in themselves or their families, had suffered from what appeared to the doctor to be some malarious influence, and they would die or become discouraged and leave the place. Immediately behind that house, perhaps ten rods off, an arm of the river backed up in high water, and made a sort of swamp; perhaps there was a little brook came in there, but at any rate there was an arm of the stream made up there, in which lily-pads grew. It was a marshy place and it was supposed, after a time, that the trouble came from there. There was a rim of bushes grew up alongside of the marsh, between it and the house, and the last owner had some doubt in his mind whether he would cut them down or let them grow. He did not altogether like the

looks of the bushes, right there in the midst of the farm, but still, they covered up the lily-pads, and he concluded to let them remain. Those trees, which are mostly deciduous trees, are now twenty or twenty-five feet high, and the man and his family are perfectly healthy.

Now, we learn two things from this: In the first place, if we locate our houses where malarious currents will play upon them, we must expect to suffer from sickness; and, in the second place, if we are unavoidably so situated, we can defend ourselves very easily.

I am particularly interested in the matter of barns, for this reason,—we have got to build a barn for the College at Orono, very soon. We have got a barn now, but it is not fit for any farmer in the State of Maine to go and look at. I am ashamed to say that I am one of the owners of such a barn. We must have a new one, and the suggestions of the gentleman in regard to the building of barns are worth a great deal to us. His remarks on that subject led me off again. I said to myself, if I was obliged to build that barn, or make the plan for it, the first thing I would do would be to go and see one of those barns which the gentleman has named, because we can comprehend such a thing better by seeing it than in any other way. He spoke of the danger of making a barn too complicated; I did not think of that. I had been in a barn where I did not know the way to go out, but it did not occur to me that it was the fault of the barn rather than my obtuseness. A barn may be simple, and yet be adapted to its purposes. That is the very point to which we should give more attention.

Pardon me if I bring in my own experience here. Some fifteen years ago, having about twenty head of cattle on the south side of my barn, and being a little short of hay, I had to feed some grain, and the question came up in my mind what I should buy—corn meal, shorts, cotton seed, oats, or what? I said to myself, the way to settle that is to buy a little of each, and try it. I brought out my cattle, one at a time, and placed them on the scale, weighed them, and set the weights down; this one is giving milk, that one is at work, that one is doing nothing. After following that a few weeks and trying the different kinds of provender, I settled down upon a principle in the matter of provender; but that is not what I was coming at. I kept a record of the thermometer at the same time, and I found that when the average

temperature for a week (taking three observations a day,) was 18° below zero, it would take almost as much again provender to keep the cattle from falling away, as it did when the average for the week was 23° above zero. I learned from that, that it is cheaper to keep my cattle warm with hemlock boards than with corn meal, cotton seed meal, or any thing of the kind.

I went through the winter in that way. A great many thoughts were forced upon me that winter, and the next summer, having an old-fashioned barn, such as has been described here, except that the boards ran lengthwise of the barn, I went to work and made that barn as tight and warm as I could, and put in ventilators to carry off the foul air. I am satisfied that a warm tie-up will save a quarter part of the expense of keeping cattle. We do not think enough of this matter. I was in a stable this morning where I saw that the man had adopted the plan of blanketing his cow, and I do not know but that is just as well. It is warmth you want, and you have got to supply it, either in fodder, shingles or blankets, or in some other way. A certain amount of animal heat must be kept up. Beyond that, you may go on making beef or fat.

Mr. FARRINGTON of Orono. I want to say a word or two, but I want to stipulate beforehand that these reporters shall stop their pens, for I am going to speak a little of private matters, which I would not like to have reported.

When I first went to housekeeping, I lived in a north tenement. I lived there for fourteen years, and if you spell the word with an *o*, it was a sonny house, if you spell it with a *u*, it was not. Two years ago, I went to Orono, and I am now living with my family in the farm-house there. I assure you that what one of the speakers has said about the barn at Orono will not apply to the house, for that is sunny and has been ever since I have been there, both ways of spelling the word. Now to the point. My children came from healthy stock, and I could not understand why they were not healthy themselves, but my doctor's bills, until the year before last, were larger than I could afford. My physician used to tell me that it was not healthful to live on the north side where the sun came so seldom, but circumstances seemed to render it necessary. I could hardly believe that what he said in regard to the unhealthfulness of it was true, but since living at Orono my doctor's bills have decreased a hundred per cent. and more; perhaps owing in part, to the fact, that our old

family physician not being accessible, we have relied upon ourselves, when before we should have sent for the doctor; but I know that in great part it must be due to the sunny situation, the rooms open to light and air, well ventilated (some of them almost too well) and plenty of sun.

One other word. The barns of which Mr. Perley speaks are well ventilated. When I went there the tie-ups were open to the floor, and of course were open to the whole barn; the cattle were substantially, as far as temperature was concerned, out of doors. A year ago last fall, we put up a rough boarding of hemlock in front of them. Mr. Perley, who was there after we did it, said, "Mr. Farrington, that is the best thing you have done since you have been here." He objected to my using leather hinges made from old boot legs; he said iron ones would not cost much. I told him we were poor and must economize, but I hoped it would be simply a temporary expedient. This fall we have done away with the old sliding windows,—for we are obliged to throw our manure out of doors, there is no other place to put it,—and put in glass windows and made tight fitting frames around them, so that the barn is sufficiently close; but not too close, because the boarding in front is hemlock and it has shrunk some since it was put there.

Now as to the result. I have nothing to say in regard to the stock when I went there. It was a year of short fodder and very little of it. We have weighed out the hay, the shorts and the grain; we feed the same amount that was said to have been fed two years ago, and the difference in the stock I attribute very largely to those hemlock boards and the glass windows. I think the difference is such as will recommend the use of both.

Mr. Hyde. A water-closet is a pretty essential part of a building which in the country we do not think enough of. In the city we have convenient arrangements, but it is a terrible waste of manure and farmers cannot afford to have them. I have studied up, in my own premises, how to save this manure, and at the same time keep the house from any vile odors, and after many experiments I have adopted this plan: I have a privy in the house and in connection with it I have a tight vault,—air tight, if possible,—into which I throw, from time to time, earth or coal ashes, or any absorbent; and in order to keep up the proper circulation of air, I put a tube into this vault, running up as high as the top of my house, and I know that the circulation goes down

through the hole into the privy and out through that tube, so that it is a perfectly sweet room, at all times. I think night-soil is of great value and I use not only my own, but pretty much all the night-soil of the village near me. I find there is no fertilizing material equal to it.

QUESTION. What are your conveniences for getting out the soil?

Mr. HYDE. I open the trap-door of the vault, back a horse-cart up, and throw it right in. I clean it out in the spring and fall.

QUESTION. Do you use pulverized soil?

Mr. HYDE. Yes, sir, dry soil. It is not necessary that it should be perfectly dry. It is on the same principle that earth closets are constructed. The vault is made of stone and cemented up. It is so mixed with my soil that I haul it right on to my gardens. If it was pure I should compost it of course.

EVENING SESSION.

The Convention met at the usual hour, President PERCIVAL in the chair. The President introduced as the speaker of the evening, Hon. J. B. WALKER of Concord, N. H., who delivered an exceedingly interesting and instructive address on Plows and Plowing, illustrated with drawings and sketches, which greatly assisted the audience in fully comprehending the principles enunciated.

PLOWING.

BY JOSEPH B. WALKER, OF CONCORD, N. H.

And I wad tak to the stilts again, and turn sic furs on the bonny rigs o' Milnwood holms, that it wad be worth a pint but to look at them.—*Cuddie Headrigg.*

The geologist tells us that the planet which we inhabit is a mass of fiery molten matter, molded into spheroidal shape by its diurnal motion, and enveloped in a crust of rock some fifty miles in thickness, whose external surface has, in the course of ages, under the action of air, frost and water, been reduced to the softer covering which hides it, and which we call soil.

A close inspection of a handful of this soil, aided by a common microscope, at once demonstrates the truth of the geologist's assertion, and proves it nothing more or less than comminuted rock, pervaded, very likely, if taken from near the surface, with the remains of the vegetation that has grown and perished upon

it. These mineral particles, although exceedingly minute, are all distinct in their individualities, and lie not in entire contact, one with another, but in confused juxtaposition, with open spaces between them, like a pile of bricks or cobble stones, carelessly heaped together.

Nor are these particles, fine as they are, solid, but full rather of minute chambers, open like the intervening spaces just mentioned, for the admission of air, moisture and heat.

Now upon a surface stratum of this soil, some dozen inches or less in thickness, stand and grow the great mass of plants which furnish food for man and beast. Smite it with barrenness, and in a brief period all the animal life upon the earth would become extinct. Cheer it with culture and other enlivening influences to which it readily responds, and a teeming vegetation will robe it in verdure and adorn it with flowers.

We are in little danger, therefore, of exaggerating the importance of any agency that will increase its productiveness. Among many, long in use, the oldest is that of the plow, and to this I beg leave to direct your attention during the half hour placed at my disposal.

I.—*Some of the Effects of Plowing.* Plowing, my friends, is an operation with which we are all familiar, but yet *why* do we plow? To mellow the soil, say you? True, but what good does that do? Promotes the growth of crops, do you reply? True, again, but how?

The effects of plowing are many and various.

1. It loosens and pulverizes the ground, previously hard and compact, rendering it light, and opening innumerable minute passages through all parts of it, from its surface to the bottom of the furrows.

2. Through the soil, thus rendered friable, may freely push themselves the myriad roots and rootlets of growing plants, as, under the guidance of an instinct as wonderful as it is subtle, they extend themselves in all directions, in search of food; travelling as unerringly to their best feeding-places, as do your flocks and herds to the most verdant spots in your pastures.

3. Through these minute avenues, closed but for the plow's action, enter into the body of the soil, the three great indispensables of flourishing plant growth, viz: air, moisture and heat.

The two first of these, freighted with carbonic acid and oxygen, immediately upon entering, set at work to break down the other-

wise insoluble silicates which hold locked up and inaccessible great masses of sustenance upon which growing plants depend for their increase and support. But for their disintergrating and softening action upon the substance of the soil, vegetation must as surely starve, as would a toothless child confined in the flinty abundance of its father's granary. But, as the carbonic acid unites with the lime and alkalies present in the ground, and the oxygen with the iron, the hard particles composing the soil, apparently as indestructible as adamant, are gradually converted to viands as delicious to the taste of plants, as was the fabled ambrosia of mythology to the palates of the gods. Indeed, the old system of restoring worn lands, to fertility by fallowing, was simply leaving them for a season, to the action of these and kindred elements.

And, through these same passages, is also admitted the solar heat, without whose presence no seed can germinate and no plant can grow.

4. Through these enter also the rains, rich in fertilizing matters, to be deposited in the soil as they percolate through it in search of the channels which are to bear them home to the ocean, from whose heaving bosom they have started on their beneficent circuits. Plowing, therefore, often performs the office of drainage, removing from compact soils the water whose prolonged presence would prove incompatible with a flourishing vegetation.

5. The plow is the best instrument with which to bury beneath the surface of our fields the manure we spread upon them for their enrichment and the weeds, which though a nuisance above ground, when properly covered, soon rot and add to their fertility.

6. We plow, also, to invert the soil, thereby burying in the furrows the worn stratum at the surface, and replacing it with a fresh one from below; so that, during the intervals of plowing, there have been alternate periods of rest and recuperation, similar in some degree to the following to which previous allusion has been made. If at the time of inversion the field be in turf, the grass roots turned under, by their gradual decomposition, enrich what then becomes the bottom soil, as well and perhaps better than it can be done in any other way; so that when, in turn, this comes again to the surface, it presents itself in part restored and richer than when buried. In short, repeated plowings are repeated transfers of the more or less exhausted top layers of soil to the bottoms of the furrows, and of the partially recuperated bottom strata to the surface.

7. We sometimes plow to intermix soils of different qualities, lying in juxtaposition, but separate and distinct from one another. If, at any time we can, in this way, mix porous and barren sand with compact and retentive clay, we greatly improve the physical texture of the soil, and render land, before almost worthless, of high value; so that where, as in some of our drained low grounds, a thin stratum of muck is underlaid by sand, the simple mixing by the plow of the two produces a soil that will remain productive without manure for generations. The forking over and loading and drawing and spreading of manure is a laborious business, the most so, perhaps, of any upon the farm. Whenever, therefore, we can make the plow supersede the dung cart, we had better improve the opportunity and save thereby many a hard-earned dollar and many a back-ache.

Such, my friends, are some of the reasons which induce us to plow our fields:—to open through their soils passages for the admission of air, warmth and moisture; to loosen them, in order that plant roots may extend themselves without obstruction; to admit through them the free passage of the rains that fall upon them; to bury beneath their surface the manures we spread upon them and the weeds; to bring, by inversion, into alternate use their upper and lower strata, and to intermix the different constituents of which they are composed. Others still there are but we have not time to consider them here.

II.—*Construction of the Plow.* Now what kind of a plow do we need to effect these purposes most successfully and economically?

1. We want one adapted to the work it is called upon to perform. We can break up our meadows with a seed plow, and we can bury the manure we spead upon them with a sod plough, but it would be as uneconomical as foolish thus to do. And yet, how few of us are careful to use only the plow best adapted to the work we have at hand! We sin, however, less in this particular than the generations that have preceded us. It is wonderful to see with what implements these have wrought. We can trace mentions of the plow down through all the centuries, from the time when, eighteen hundred years before the Christian era, "Job's oxen were plowing and the Sabeans fell upon them and took them away." We find Elisha "plowing with twelve yoke of oxen, and he with the twelfth," and Cincinnatus leaving his plow in the field for the dictatorship of Rome, and our own gallant Putnam, stopping his team in mid furrow, that he may seize his

sword and hasten to Bunker Hill, at the reveille of our Revolutionary war.

But what plows were those with which these great worthies pulverized their soils?

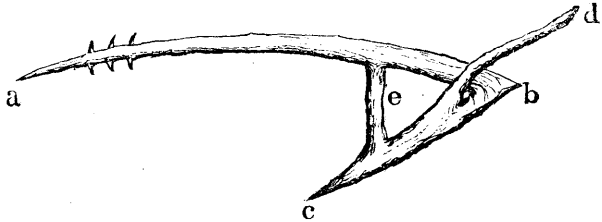

FIG. 1. Ancient Plow of Asia Minor.

At first, the plow was a forked stick, one prong, cut short, answering for the share, and the other for the beam, which was attached to the yoke by a short pin in front, and guided by a straight standard behind.

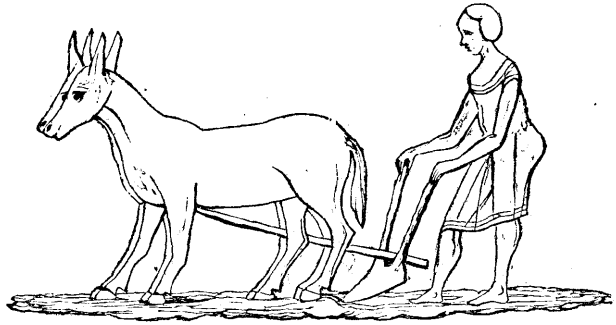

FIG. 2. Ancient Egyptian Plow.

As time passed on, and experience ripened, a rude mould board was added, and by and by a colter, and at length a wheel.

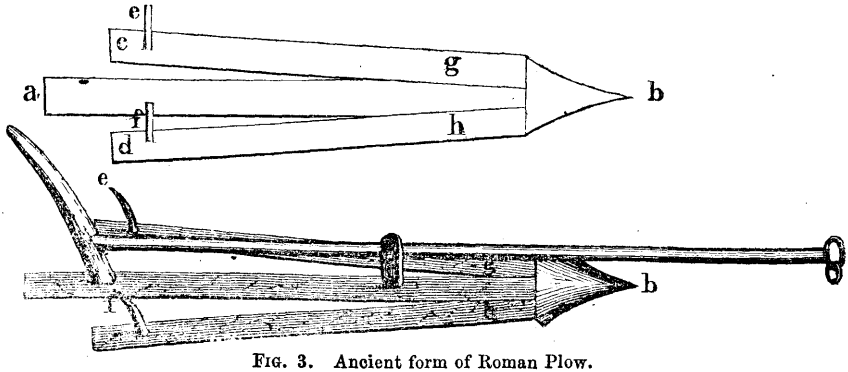

FIG. 3. Ancient form of Roman Plow.

The drawings and descriptions that have come down to us from antiquity show conclusively that the early plowman sought merely to root up the ground, and attempted nothing like a well turned furrow. Indeed, it was not until a time comparatively recent, that the plow approximated the shape it now bears, or produced work akin to what we are accustomed to see.

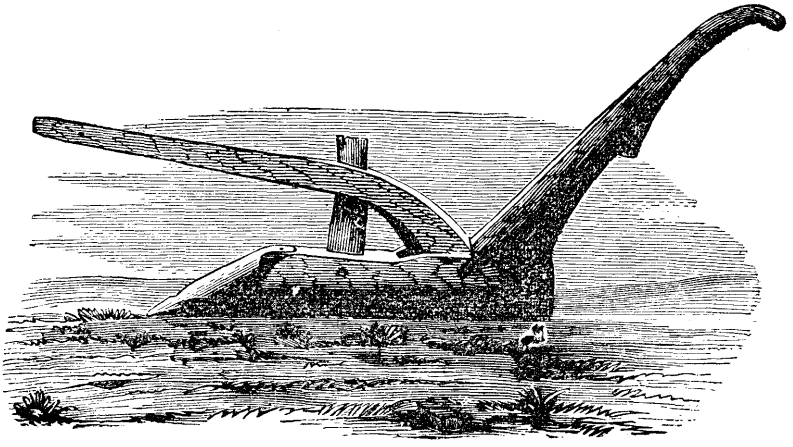

FIG. 4. Mexican Plow.

With the exception of the share, sole and colter, it was constructed of wood, and an absurd prejudice was for a long time more or less common among English farmers that an iron mould board poisoned the soil. Indeed, the first cast iron plow made in this country, by Charles Newbold of New Jersey, dates only from 1797. This was cast in a single piece, and nearly a quarter of a century elapsed before Jethro Wood, in 1819, made the next important advance, by making iron plows in sections, fastened together as is now common.

And, until the opening of the present century, it was constructed upon no settled principles by persons whose skill was entirely empirical; who sometimes succeeded and sometimes failed in producing successful implements, and whose art, such as it was, being as ephemeral as themselves, died with them.

But near the close of the last century our distinguished countryman, Thomas Jefferson, in a communication to the French Institute, announced to the world a principle by which mould boards exactly alike, could be made, in any number, and by persons unknown to each other, viz: by the combination, in a curve, of

the adjoining faces of two wedges, one to act vertically and lift the furrow slice, and the other laterally and turn it.

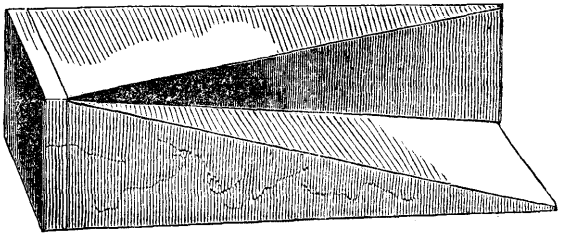

FIG. 5. Illustrating Jefferson's original idea of the Plow.

This was the first entrance upon solid ground in the career of plow-making, and from this commencement has been gradually developed the settled rules now allowed in the business.

Four distinct and very important offices attach to the plow, viz: to cut, raise, turn and pulverize the soil. The excellence of any particular plow is measured by the ease and perfection with which it accomplishes these four things.

The cutting edges therefore should be made of such material as to insure their being easily kept sharp, that they may sever the furrow slice with the least possible resistance, while the feather should be of such a length as to cut so much only of this from its bed as may be necessary, a shoulder being always left uncut, on which it may turn, without slipping from its position. These edges should also be adjusted as to work in precisely the right lines, and allow the plow to be held vertically, otherwise it will veer from its course, or be kept upon it only by an increase of its draft. For instance, if the edge of the colter inclines to the left, even in a slight degree, the tendency of the plow will be to run too much to land, and the narrow slice can only be kept of proper width by tilting the plow in the same direction and crowding its left side against the land, which will enhance seriously the friction of its motion and increase its draft.

This tipping of a plow one way or another, particularly in deep furrows, not only makes hard work for the plowman, but increases unmercifully the burden of his team; and yet, it is a practice which is very common and to which we are wont to give but little thought. We complain frequently, on our own account, that a

plow is a hard one to hold, but seldom think of the effects of our tiltings of it upon our teams.

Carefully conducted experiments, made by an able committee of the New York Agricultural Society, in 1867, demonstrated that of the whole draft of an ordinary plow, fifteen per cent. was expended in overcoming the friction of the soil upon the furrow's bottom; five and eight-tenths per cent. was absorbed in the mould board; thirty-five and a half per cent. in the land side and forty-two and two-tenths per cent. in the share and colter. Now, any boy who has turned the grind stone, before breakfast, for his father to grind his scythe in haying time, very well understands the effect of the old man's bearing on hard in order to get done quick, and remembers how willingly he would have exchanged places with him. Just so in plowing, the increased friction caused by canting the plow first one way and then the other, to make good work, enhances greatly, at times, even to the doubling of the burden of the team.

The share and mould board of a plow should be so constructed as to raise and turn the furrow slice with the least possible friction, and, consequently, with the least possible expenditure of motive power. If the angles at which these incline to the sole and land side be too great, or in other words, if the plow is too blunt, it will drag hard through the soil, which, instead of sliding over it easily, will pass it with difficulty, or perhaps even be pushed before it.

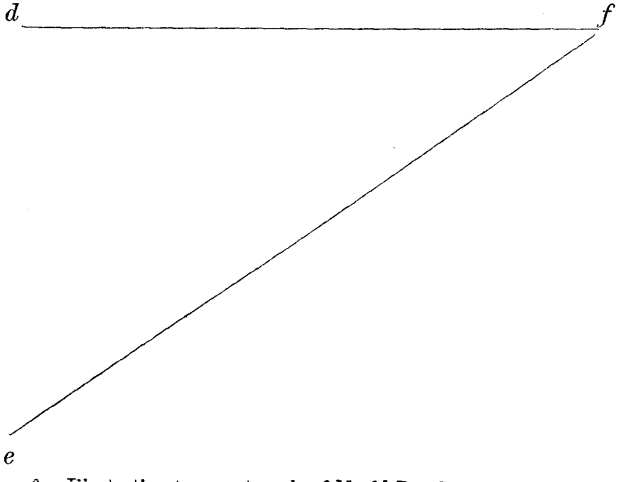

FIG. 6. Illustrating too great angle of Mould Board to land side of Plow.

If, on the other hand, these angles be too acute, such an increased length of mould board will be requisite to turn the furrow slice, as will produce unnecessary friction by its too elongated surface.

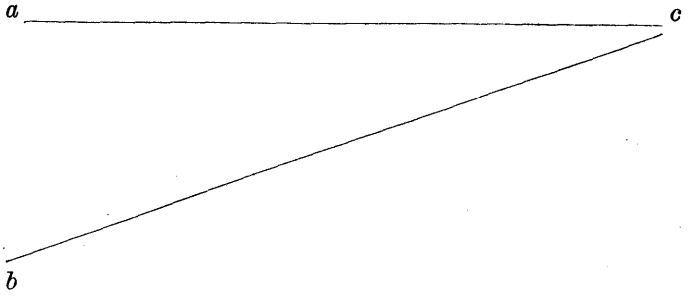

FIG. 7. Illustrating too acute angle of Mould Board to land side and consequently unnecessary elongation of former.

The share and mould board should be adjusted, therefore, at just such angles to the plow sole and land side, as will secure the plow's motion through the soil with the least friction consistent with good work by the plow. The construction of a share and mould board upon the principle of blending in one surface the adjoining faces of two wedges, one acting vertically and the other horizontally, will give a mould board of concave surface, and plows are now sometimes made whose shares and mould boards were modeled upon the frustrum of a cone. A plow thus constructed will turn handsome furrow slices but will not produce that degree of pulverization of the soil which is most desirable. This, however, may and should be secured, by making some portions of the mould board's general concavity slightly convex, so that, without any material increase of its friction, it will break the furrow slice by twisting it, and by causing different parts of this to slide over it with unequal velocities. This twist is all important in a mould board, for although we may twist a strap of leather or a hempen cord without fracturing it, it will be found otherwise with a furrow slice.

2. A plow should be so made as to run naturally in a vertical position and mostly take care of itself, so as to require but little holding. In breaking up, a day's work at the handles of such a plow is agreeable pastime, while with another, requiring a constant strain upon one arm or the other to secure an even furrow slice, aided frequently by a push of the right foot or knee, to complete its turning, is exhausting and vexatious labor; and if, now and

then, a rod or two of this, which you supposed inverted, falls back again to its former position so that you are compelled to stop your team and replace it by hand, your serene spirit will very likely be ruffled and yourself left to use some expressions you ought not to utter, and to wish the plow maker in a place where it were very sad to think he had gone.

3. Canting a plow either way, not only increases its draft but causes it to make imperfect work. The bottoms of the furrows, instead of being left level and in one continuous plane, will be tilted and present a series of parallel ridges, which will be found upon examination to have not been stirred at all.

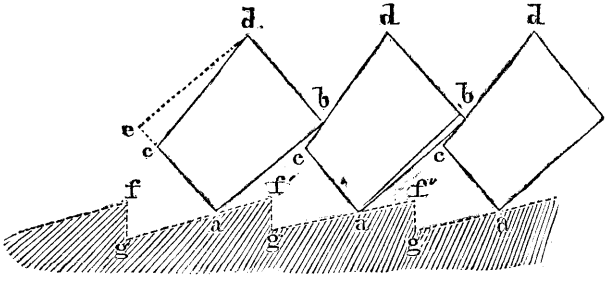

FIG. 8. Showing uneven surface of subsoil where plow has been tilted to the left.

4. A plow should be of such a shape as not only to secure ease of draft, evenness of wear and thoroughness of work, but should be made in the most thorough manner and of the best materials. Its wood work should be of oak, perfectly seasoned, and bolted to castings of sufficient and rightly distributed strength, that it may be both light and strong. The lighter the plow the better, provided its durability be not sacrificed, for, as we have before remarked, no less than fifteen per cent. of the whole power expended in moving it is required to overcome the friction of the sole upon the ground.

5. The outer surfaces of the land side, mould board and share should be thoroughly smoothed and the cutting edges be made hard, that they may be kept sharp. I saw a plow, of good reputation, fail entirely at a trial of plows, at the New Hampshire Agricultural College farm, two years ago, simply on account of the roughness, of its land side and mould board. These would be better if made of steel, but iron answers a good purpose if kept bright and smooth. The manufacturers of the Collins steel plow claim that its draft is twenty per cent. less than that of other

plows of similar size, in consequence of the very high polish of its hardened surfaces.

In short, the best modeled, most thoroughly made, lighest and easiest running plow is the most economical one to buy and use, for it secures the best pulverization at the least expense of implement and at the least expenditure of strength by plowman and team.

A moment's consideration will give us some idea of the value of the latter quality—lightness of draft. It has been estimated by Prof. J. Stanton Gould, who has written the ablest treatise on plowing we have ever met in print, that it costs the farmers of the United States twenty millions of dollars a year to do their plowing. The same gentleman states that, from actual experiments, witnessed and conducted in great part by himself, the plows in common use in this country differ in draft no less than forty-two per cent. and that the universal adoption of the light draft plows would reduce the annual expense of our national plowing eight millions and four hundred thousand dollars and add that much to the sum of our yearly farm profits.

III.—*When and how to plow.* 1. Now a few words as to when and how to plow. The fall is doubtless the best time to do our breaking up. The weather is then cool, and we are usually less hurried than in spring. The inverted furrows are subjected to the disintegrating influences of the winter frost, and if done late, the grub worms in the soil will, many of them, be destroyed by the cold. By breaking up our sod ground in the fall, we forward somewhat the work of spring, which with us is a brief season and frequently a warm one.

For other plowing no definite times can be assigned and we must be governed by the exigencies of the particular occasion. But we should never plow land when it is decidedly wet, as it soon settles back into its former condition, and we expend our labor for naught. Neither, if we can avoid doing, so, should we plow when it is very dry, as the plow runs hard, and the operation is more than ordinarily expensive.

2. By all means arrange to have team enough to draw your plow easily and comfortably. It is distressing to see a team urged beyond its strength, moving at a snail's pace and kept in motion only by the punching of the goad or the swing of the whip. Cattle walk easiest at their natural gait, and when so loaded

as to diminish this, there follows a greater loss in time than saving in motive power.

How often an extra yoke of oxen added to a breaking-up team, has increased the work accomplished, from an acre and one-half to two acres a day, a gain of thirty-three and one-third per cent. with an increase in expense, very likely, of less than fifteen per cent *

3. A team should be attached to a plow in such a way as to let the latter "swim fair" in the furrow and thus secure the highest draft. We frequently hitch the front end of the chain attached to the plow too high, and the cattle draw to a disadvantage. Experience has shown that the most desirable elevation of a chain is at an angle of about twenty degrees with the plane of the furrow's bottom. If the rear cattle are large, as they ought to be, this elevation can be secured only by the use of a drop-link, which should always be used when required.

But we frequently find that the objectionable work of a plow is due, not to the plow, but to the insufficient length of the yoke, worn by the rear oxen, and will disappear altogether upon the substitution of another a few inches longer.

4. It is a matter of great consequence that the cutting edges of a plow be always kept sharp, as it is far easier, and consequently cheaper, to cut than it is to tear the furrow slice from its bed, and to say nothing of the imperfect work caused by the doubling of roots across the colter's edge or the share's point or feather, the increase of draft caused thereby, is as serious as it is needless. As we have before stated, no less than fifty-two and two-tenths per cent. of the whole draft power is absorbed in the share and colter. With this fact in mind, any one who has cut turf with a dull shovel and also with a sharp one, will readily appreciate the unnecessary burden thrown upon a team by a dull share and a colter clogged half the time with roots.

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* This statement is based upon my own experience in breaking-up sod land, which is as follows :—

Three men and six oxen plow in one day one and one-half acres at cost of.....$15 75
Three men and eight oxen plow in one day two acres at cost of..... 17 75

$2 00

While the increased expense of team was $2.00 or 12.69 per cent., the increase of area plowed, was one-half acre, or 33 1-3 per cent.

5. I think we lose no time in considering maturely the best manner of striking out the lands we are to plow; and the method of procedure should be fixed for all of them before the plow point pierces the surface of the first. Much loss of time and bad plowing often come from a neglect of this, as many of our fields are odd-shaped and far from level. A square or parallelogram is the simplest and most economical shape, for we can plow it with few or no dead furrows, and with little loss of travel.

A piece of land forty rods long and twenty-four rods wide contains just six acres. Supposing it level, how would you strike it out for plowing? I would not begin by plowing a furrow for its whole length up one side and down on the other, dragging the plow across the head lands, to finish with one dead furrow in the middle, for there would be too much loss of travel across the ends.

Neither would I begin as before and plow around it and finish with a short dead furrow in the middle, for I should do all my turning on newly plowed ground, thus undoing in part what I had just done. Nor would I divide it, as is very common, into three or four lands and plow around each until done, for I should then have as many dead furrows as there were lands.

I would prefer, rather, having staked out the piece into three equal sections, each of equal length with the piece, first to back furrow the two outer ones, and then go around the middle one, finishing with one dead furrow in the middle of the last one, and one ridge in the middle of the other two sections.—(See Fig. 9.)

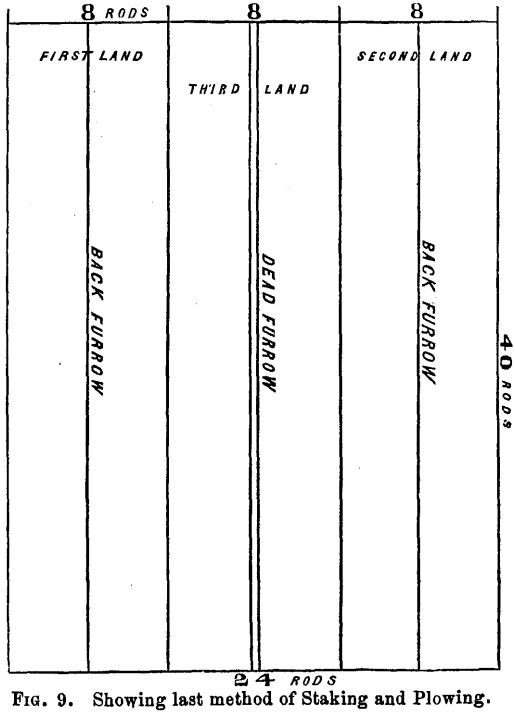
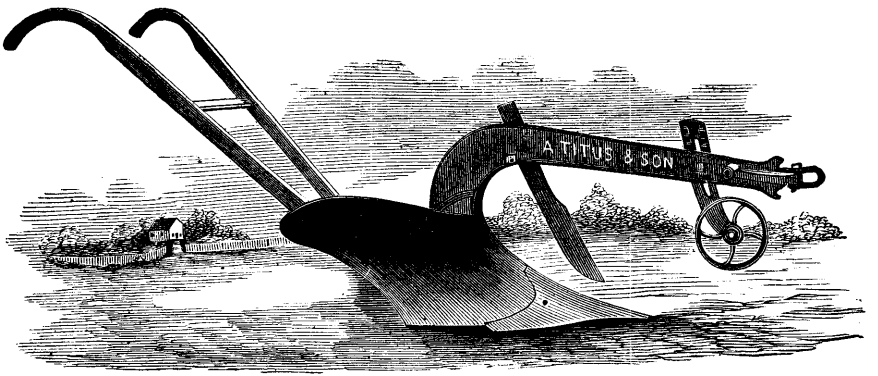


FIG. 9. Showing last method of Staking and Plowing.



CAMPS' EAGLE A PLOW,

Manufactured by the Higganum Manufacturing Company, Higganum, Conn. Awarded the SILVER MEDAL by the Maine State Agricultural Society, at Bangor, 1873. FRED ATWOOD, General Agent, Winterport, Maine.

If the dead furrows and ridges are an objection I would commence with a short back furrow, sixteen rods long, whose ridge and ends should be equally distant from the sides and ends of the piece, and plow around this until the entire land was completed, with no turning upon plowed ground, with no dead furrows and with a single short ridge, sixteen rods long in the middle.—(See Fig. 10.)

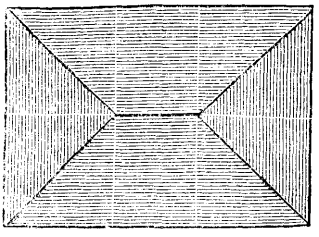


FIG. 10 Showing plan of laying out and plowing.

Should the piece be a triangle, the central point may be found, and three furrows, parallel and proportionate to the sides, and as short as possible, may be turned upon it. Starting thus the work may be continued from the centre outward, until the whole piece is finished, when it will be found that no ridges or dead furrows have been made and the team has not stepped upon the newly plowed grounds.

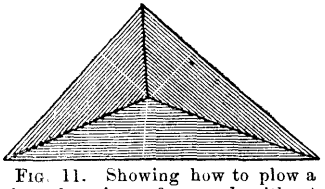


FIG. 11. Showing how to plow a triangular piece of ground without ridges or dead furrows.

But we have not time to consider in detail the best methods of staking out lands. Fields differ greatly in size, shape and surface and the methods to be adopted must vary accordingly. The great points in every case to be secured, as far as possible, are the avoidance of all unnecessary travel; of dead furrows and ridges; of turning on freshly plowed ground, and in all hillside work, the securing the assistance, rather than the opposition, of the force of gravity. (See Fig. 12, following page.)

6. The depth of our plowing should also be governed by circumstances and vary with the character of soils and the objects had in view. Lands covered with a tough witch grass sod, taken up to be manured and after a year or two to be laid down again, should be plowed deep enough to bury the fertilizers applied for their enrichment, without disturbing the inverted sod. In such cases nine or ten inches is generally a sufficient depth. Skim plowing, to bury manure, should be as shallow as it can be consistent with good work. Four inches is a fair depth for this. In ordinary plowing, for pulverization only, seven inches does well; but in old fields, the top of whose subsoils has been compacted by the repeated treadings of teams, that have plowed it an hundred

times before, into a crust as hard almost as stone, the plow should be let down to such a depth as will enable it to crush this and destroy the impervious barriers, thus separating the lower from the upper soil. Professor Gould says of soils, "those which have the greatest amount of capillary porosity will condense the greatest amount of manurial substances on their internal surfaces; will retain them longest against the adverse solvent action of waters, and will give them out most readily to the rootlets of the growing plant." The deeper therefore the pulverization the greater will be the proportion saved of the manure applied for their fertilization and the less the proportion carried by rains into the subsoil.

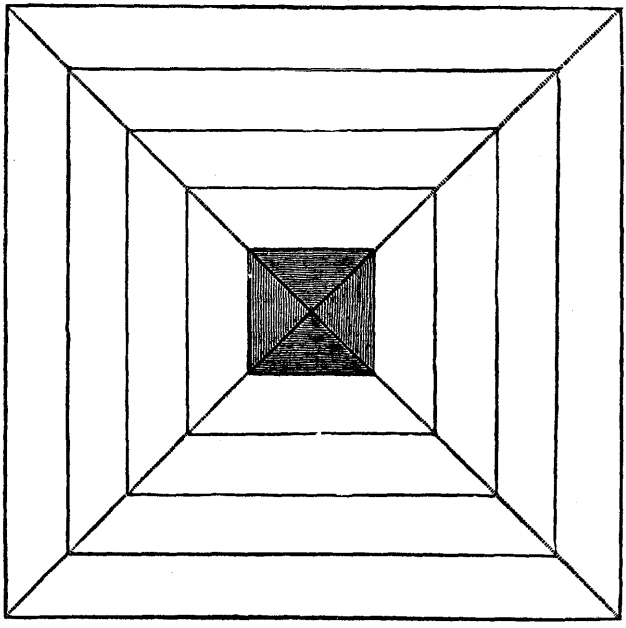


FIG. 12. Showing how to plow a square piece of ground by back furrowing, so as to avoid dead furrows and ridges.

It is asserted by a committee of the New York Agricultural Society that the average depth of plowing in that State is only four and a half inches. Is it more than that in New Hampshire? If not, by adopting a system of nine inch plowing, we may, many of us, bring up from beneath a new farm to take the place of the old one, of which, perchance, in this day of novelties, we have grown tired. By doubling the depth of our plowing we may double the productive capacity of our farms.

7. The width of a furrow in ordinary work should not be far from once and a half its depth, or about in the proportion of ten to seven. When, from the nature of the soil, perfect pulverization cannot be secured at this width, it should be lessened until the furrow slice is stirred thoughout. On tenacious sod lands, where the object in view is inversion rather than pulverization, its width may oftentimes be twice its depth.

8. And here rises an interesting question. Shall we lap our furrow slices one upon the other, or shall the last, completely inverted, lie flat upon the bed from which its predecessor was taken?

On sod lands there are several advantages in lapping them. Thus laid, a greater surface of fresh earth is exposed to the action of the elements than when laid flat with both their edges covered. A portion of the turf, thus turned under, lies elevated a little above the furrow's bottom, so that the open passage beneath, besides serving as an underground drain, if needed, admits air to hasten the sod's decomposition.

Disadvantages also attach to this mode of plowing. Grass is apt to spring up between the furrow slices, to the prejudice of the next crop, particularly if a hoed one. The skim plow sooner strikes the unrooted turf and must be run at a less depth than on land plowed flat.

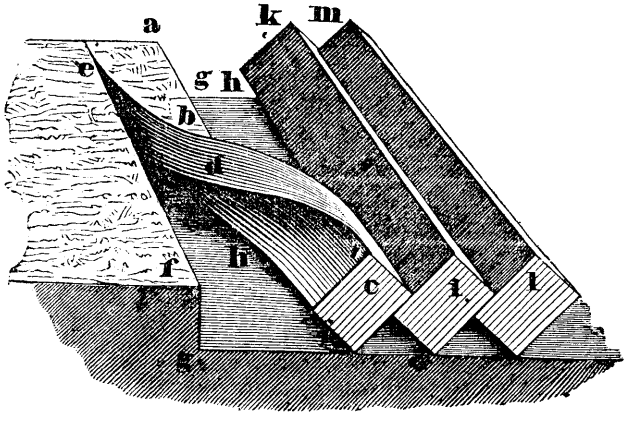


FIG. 13. Plowing with Lap Furrows.

Land plowed flat presents an even surface for the skim plow, the harrow, the cultivator, or whatever implement be used upon it. The sod is all buried and at a uniform depth. Theoretically

the grass is all squelched, but practically not quite, though nearly so.

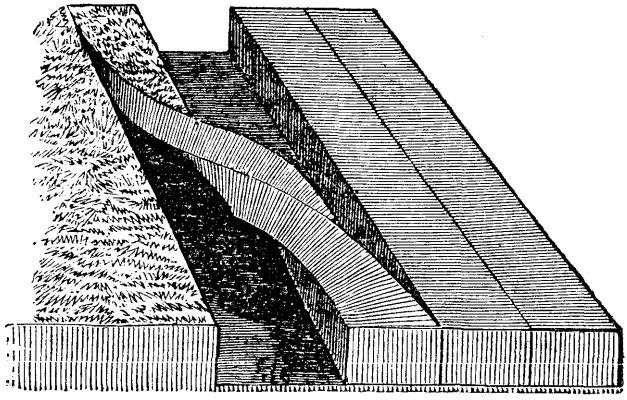


FIG. 14. Plowing with Flat Furrows.

I have scmetimes used for breaking up grass ground a plow whose land side and colter stands at an angle of about eighty degrees with the plane of its sole, cutting a beveled edged furrow slice, which as it turns over, wedges itself against the edge of its predecessor and lies nearly but not quite flat, with a small space between it and the surface of the subsoil. On my own farm there has been found attaching to such kind of plowing more excellencies and fewer objections than to any other.

9. There is one other point to which I wish to call your attention which, I fear, I may have already wearied, and that is thoroughness. Let us be honest in this work of plowing and not deceive ourselves to our own hurt. If we put in the plow, either to invert the sod, to bury the weeds, to pulverize the soil, to cover the manure, or for what purpose soever it may be, let us be content with nothing but thorough work. Let us have no balks, covered or open; let us leave no corners unturned for the choke cherries and raspberry bushes; let us finish every headland to its outmost verge; let every furrow, however long, be straight; let every weed and grass blade be buried from sight, and one uniformly fair surface proclaim us good farmers by our work well done!

I know of no place where a rational happiness is more likely to be found by a farmer, than between the stilts of a good-running plow, in a clean, straight, furrow, in a field he can call his own. He walks a man there, dependent upon no one but his Maker,

stimulating and assisting the forces of nature, and manfully and honestly earning his bread.

10. But, as now conducted, plowing on a large scale, is felt to be a slow and expensive process, and this new spirit of a new age now everywhere abroad, is yearning for plows that will turn a dozen furrows at once, to be drawn by a steed whose breath is scalding hot and whose muscles never tire. The great plantations of the South, and the boundless prairies of the West, together with the broader fields of the East, demand the steam plow, that will turn ten acres a day, at an expense of one dollar per acre.

This great problem, for a long time studied, has been as yet only partially solved. But science and mechanical skill have joined their highest efforts, and its perfect solution is near at hand. With what earnestness it is studied, may be inferred from the fact that in 1871, our government alone issued no less than thirteen patents for steam plows, all possessed of individual excellencies, although no one has proved a complete practical success.

The plow has ever been the symbol of our occupation. It is older than the pyramids. The once fertile but now desert plains of Nineveh and Babylon knew it. The valley of Esdraelon, the delta of the Nile, the campagna of old Rome, the fields of Europe and the wild expanses of our own land, have all submitted to its kindly influences and evinced their gratitude therefor, by abundant harvests. Wherever man has passed from the wandering habits of the savage or the nomad to the settled life of civilization, he has ever found the plow indispensable to his very existence. Its journeys exceed in length those of all the ships and locomotives that have traversed sea and earth; and the vast revolutions of our planet measure less than the outgoings and ingoings of its furrows.

Its victories have been greater than the victories of the sword, for it has subdued sterility, it has awakened to activity the inert forces of nature, it has covered the naked plain with verdure, it has fed our race and caused the solitary place to be glad "and the desert to rejoice and blossom like the rose."

QUESTION. I would like to ask the gentleman whether he considers plowing under manure the best way to apply dressing to the land.

Mr. WALKER. That depends upon circumstances. My farm is

an interval farm, upon the banks of the Merrimack river, which overflows every year, and I am obliged to plow my manure under to save it. I think that is the best plan for me, under the circumstances. Another reason is: if you plow your manure under, about four inches, you have got it down about where you want it for the roots of your grass, corn, or grain. We know very well, that a great deal of the manure that we attempt to work in by the harrow does not get worked in. If we work it by the plow, we do get it in. The manure that is left upon the surface is not only left to be dried up and blown away and wasted, more or less, but you are aware that the grass roots cannot touch that manure, if it is above ground. My practice has been to plow in my manure, and I practice it because I am satisfied, for the reasons I have stated, that it is on the whole, the best way for me.

Mr. ———. In that case, we should have to plow our land here twice.

Mr. WALKER. Well, that won't hurt it.

Mr. ———. I presume it would not hurt it; it would be a benefit to it, I think.

Mr. WALKER. I think we do not pulverize our soil enough. The fact is, we understand very little about the pulverization of soils. I do not think we begin to understand it. I thought, at the beginning of this winter, that I knew something about plowing. When I had finished the paper which I have had the honor to read before you to-night, I came to the conclusion that I was very ignorant upon the subject of plowing.

Mr. LUCAS. Have you ever seen a plow made upon such principles that a straight line will touch the whole face of the mould-board, from one end to the other?

Mr. WALKER. No, I don't think I ever have.

Mr. LUCAS. A man in the vicinity of where I live has got a pattern of that kind of plow, and I think has got the castings done and applied for a patent. My object in making the inquiry was to ascertain whether you had ever seen anything of the kind, or anything approximating to it, and could express any opinion as to the value of such a plow. His idea is that our plows all haul hard and clog, and that that is the only way that a perfect plow can be constructed, so far as the mould-board is concerned.

Mr. WALKER. I should think a mould-board so constructed would be very likely to turn a good furrow, but it would not give it the twist which is necessary to pulverize the soil. That would

be what I should fear. You get a pretty good plow by modeling your mould-board upon the frustrum of a cone. Your mould-board is entirely concave, and when you turn a furrow, you simply invert it; you do not stir it up. The whole of the furrow slice moves over that mould-board at an even velocity; whereas if you interpose a little sphericity or a little convexity upon this concave mould-board, the furrow slice will move over it at different velocities, of course breaking the furrow slice, and giving you a better pulverization.

QUESTION. What has been your experience with the Michigan plow, for pulverization?

MR. WALKER. It is the best pulverizing plow I ever saw, but we do not use it much with us; why, I hardly know. We tried it for a while. When we first got the Michigan plow, we supposed we were putting the witch-grass down at the bottom of the furrow, but we found we did not; and where we are full of witch-grass, as we are on the Merrimack river, we find we get too much witch-grass if we use the Michigan plow. We should have it, if we were not going to raise a hay crop and a crop of rye or wheat immediately upon the sod.

QUESTION. Have you ever seen a plow that excels on both rough and smooth land?

Mr. WALKER. I do not want to speak except from my own experience, and I have not had experience upon the rough soils of which you speak. But it stands to reason that you will not find the same plow working as well on one soil as you do on another. For instance, on the smooth interval soils of your Kennebec valley, I suppose you want a flat plow, that has a pretty long heel and will turn a pretty wide furrow, and pulverize it well as it turns it; whereas, if you go upon rocky soil, you necessarily use, I suppose, a shorter mould-board. But the point that I wish to make in the paper was, that we ought to get plows adapted to our particular soil and our particular work. If it is necessary to have half a dozen plows, let us buy them. Let us not undertake to use plows that are not adapted to the work we are doing.

QUESTION. Did you ever attempt to destroy witch-grass by plowing and did you succeed?

Mr. WALKER. Well, I used to try to kill witch-grass, but I pretty soon found I was in the condition of a man, such as you once in a while see, who is yoked with a companion who is not

altogether what he could wish. The sensible thing, under such circumstances is, to try and love those you are with as well as you can. In other words make the best of them. I have given up trying to get rid of witch-grass, and have got round to the position of any sensible woman who finds herself with a companion whom she does not very much like. I have got so that I love witch-grass. The fact is that witch-grass hay brings as much in our market as any other hay. No matter whether it is wet or dry, whether we have manure or do not have manure, we always get a catch of witch-grass. No matter what we sow, the witch-grass always comes, and we get a crop of something.

Mr. Z. A. GILBERT. The gentleman speaks of combining two principles in the plow—that of inverting the sod and pulverizing the soil, which all will admit is very important. Now, in combining these two principles, or in other words, adding the principle of pulverization to the plow, do we necessarily sacrifice any other principle—that of draft, or any other useful principle?

Mr. WALKER. I suppose we do, to some extent; but if it is properly done I imagine that no very great sacrifice results. I think you had better sacrifice some draft, rather than not pulverize your soil. If you will have a concave mould-board to your plow, you get a greater surface and an easier draft, but not so much pulverization. I understand that to be the fact, and I rather guess it is true. The Collins plow, if I remember rightly, has quite a concave mould-board. Mr. Collins claims that he has a plow that runs twenty per cent. easier than other plows, made of iron, (his being of steel) and he claims that the easy draft is due to the hardened steel surface of his mould-board. I presume it is, to a very great extent, and yet, if you will look at that plow, you will find it is a pretty concave plow. Hence, a portion of its ease of running is due to that.

Mr. LUCAS. Do you know anything about the difference between a coulter and knife in front of the plow, in regard to cutting the sod?

Mr. WALKER. I know nothing definite. If you will take the trouble to refer to J. Stanton Gould's report for 1867, you will find an account of a large number of experiments which were made to determine that very point.

Mr. LUCAS. Do you use the knife in breaking up land?

Mr. WALKER. I do, always; and when I am smart and do as I ought to, I grind that knife every day. We have had two kinds

of knives; we have had the simple steel knife, and we have had what is called the rolling cutter. Our experience is, that if you can get a cutter that will work just right, and let your plow run in the line in which it ought to go, it is the prettiest cutter in the world; but if it does not run just right, if you have not got the mechanical skill to keep it in running order, then the knife is the best. We find that the rolling cutter has gone out of use and we are using the simple knife.

Mr. LUCAS. I think I have heard it stated, or read somewhere, that the experiment has been tried of hauling the plow without the knife, and the knife without the plow, and it has been found that the cutter hauled very nearly as hard as the plow did without it; that there was practically little difference between hauling the knife without the plow and hauling the plow without the knife.

Mr. DOE of Saco. It has been asserted that there were no plows manufactured in Maine that were well adapted to the performance of the work that they profess to do. What I want to ask is, if we have not got such plows? We want them as much as anybody wants them. It is necessary for us to have good plows as it is for the farmers of Massachusetts or New Hampshire to have them. I want to ask the gentleman if he has ever seen the Holbrook Swivel Plow used?

Mr. WALKER. Yes, sir, I have.

Mr. DOE. Does it work satisfactorily? that is, taking the latest improvements, within the last two years?

Mr. WALKER. I saw it tried at the Agricultural College farm in connection with some other plows. I have had no personal experience with the plows, and I speak simply from observation of that trial, which I do not think any man would consider a fair and satisfactory trial of plows. It did good work on that occasion but not as good as some other plows which were used at that time.

Mr. DOE. Which plow do you think did the best work? That is what we want to get at.

Mr. WALKER. The plow that did the best work, judging simply from the work there, was a little plow called the Doe plow. I happened to be on that committee, and got myself into trouble by signing the award whereby the Doe plow was given the preference over the Holbrook plow. But I do not undertake to say from that trial that the Doe plow was the best of the two; I do mean to say, that at that one trial, the Doe plow beat the Holbrook

plow. But if you will recur to the report of Mr. Gould to which I have referred, you will find that the Holbrook plow took three-fourths of all the premiums, and there were half a dozen competitors.

MR. DOE. For the last two years I have seen the operation of the Holbrook plow, and I think it excels in every point that we aim at in plowing; that it will do better work with the same power, than any other plow that is used in the western part of the county, except the Collins plow. There are in the town in which I reside two of the Collins plows, and I think they will do the same work with less power than the Holbrook plow, but they do not pulverize the soil like the Holbrook plow, which is the great object to be aimed at. I was very glad to hear the speaker lay so much stress upon that point. My observation teaches me that we have no plow in the western part of the State that will do the work so perfectly as the Holbrook Swivel Plow. I cannot explain the principle of pulverization so well as many others have, but this swallow's tail at the end of the mould-board does a great deal towards pulverization. I have watched it carefully and have observed how perfectly it breaks the surface of the furrow, whereas the Frye plow turns the furrows flat and smooth. But my idea is, to have the furrows left with all the edges tucked in, not to have the grass come up and interfere with your cross plowing, and still have the ground in a rolling position. This will be done by the Michigan plow to a greater extent than by the Holbrook, but taking the draft and the work done, the Holbrook plow does better in our section of the State than any other plow.

THE PRESIDENT. It seems to me we have not plowed over nearly all the ground yet, but perhaps we have plowed about as long as is prudent to-night.

Adjourned to Friday morning at ten o'clock.

THIRD DAY.

The meeting was called to order at ten o'clock by the President, and the committee on the credentials of delegates from Farmers' Clubs submitted their report. It embraced reports from twenty Farmers' Clubs, and three county Agricultural Associations.

Reports from Farmers' Clubs.

Mr. L. Gilbert, East Turner. We are trying to advance agriculture, and I think Farmers' Clubs are a very good means to that end, for by them we not only promote the interests of agriculture, but we have opportunities to associate together. It is a well known fact, that the farming community are isolated and that we need to meet together for mutual instruction. It is a well known fact, that the farming community have a great many prejudices, that we are prone to follow the old ruts, and I think the Club meeting is a great advantage. It is one great means of diffusing imformation upon the important matters pertaining to our business. The farming community are not highly educated; there is room for improvement, and I believe that we can not only improve agriculture, but we can improve our condition as individuals. We need to do away with those prejudices, we need to have more education, more knowledge, and we need to have more confidence in our business. There is too much work without brains and we need to meet together and talk over these various things, and I think that is the commencement. I think these conventions are the means of setting people to thinking. We need to use our brains more. We want to study our business, and make it a *business*. There are too many who are going on without any idea except just to get a living. They do not study into their business and have no confidence in it. At this time, everyone is aware of the fact that we have a great deal to discourage us. I think we need not be discouraged. We have one of the best soils that there is in the New England States, and all that is lacking is knowledge. We need to study more, and in order to do that we must consult each other, and try to put ourselves in a condition to meet the difficulties and discouragements which surround us. Our business at present, is at low ebb. The great drouths and the grasshoppers have taken a vast amount of money from us, and now we should study our situation and try to meet the circumstances that we have to meet at present—the high price of labor, etc. I think the Farmers' Club is an advantage in all these respects.

Mr. ISAIAH WOODMAN of West Minot. I have the pleasure of being one of the delegates from the Farmers' and Mechanics' Club of Hebron. We at West Minot established a Farmers' and Mechanics' Club, October 24, 1855, and from that time to this, it has been in successful operation. We have now upon our books more than two hundred active members. We have held fifteen shows and fairs. Year before last, when the Androscoggin show was held at Mechanic Falls, the trustees requested us to postpone our show and we did, and once, in the midst of the rebellion, we omitted the fair. Our shows and fairs have occupied two days every year and we have found it difficult to get through in that time. We have had addresses nearly every year from such men as Governor Perham, Judge Luce, and Rev. Mr. George, a Methodist clergyman from Farmington. This year, Mr. Harris, the Preceptor of Hebron Academy, gave us an excellent address. We think our shows have been of great utility. The Club in Minot has one hundred and twenty-five members, and the Hebron Club about eighty.

I wish to speak of one farm in particular, that of Mr. Millett. His farm was bought some thirty-seven years ago, a miserable, worn-out place, for a thousand dollars. He has raised on that farm sixteen hundred bushels of onions, and instead of five or six tons of inferior hay, he raises grass enough to keep a large flock of sheep, three horses and twenty head of cattle, and has some hay to sell besides. His other crops are large, and he has to prop his apple trees to prevent their breaking down. This change he has brought about by his skillful farming. He has brought up a large family of six girls and one boy, and educated them all, and I believe every one of his girls can thrum the piano.

Mr. MILLETT of Minot. I am happy to be able too meet you here to-day, but I was not expecting to be called upon to say much of anything. My friend, Mr. Woodman, has given you a very full account of our Farmers' Club. He and I, with two or three more, were present at the organization of the Club. Some men, pretty active, smart men, too, told us it was no use; that there was no interest and we could not do anything. However, a few of us stirred round, notified the people and rallied them, and our first show was a successful one. We have have followed it up since 1855, and kept the meetings up pretty constantly through the winters, and we are now in a flourishing condition. The attendance at the meetings this year has been larger than usual.

I do not know that I can say anything more, in reference to the Club, in addition to what Mr. Woodman has stated.

The little experience I have had in raising onions, I will cheerfully relate to you. I have followed the business a little for three years. Being in Massachusetts on a visit to my friends, I caught the onion fever, and concluded I would take a little seed, follow the directions, and try it. Finally, as the seed was being weighed out—a couple of ounces—I remarked to my cousin, "It is no use to try it; the maggots will eat it all up." He was a good man, not a wicked man, but he brought out the words before he was aware of it, "I swear I know better!" His wife, who happened to be near, said, "I have not heard him use that word for twenty years." He says, "You are enough to provoke a saint. Take that home and plant it." I took it home. The ground was not suitably prepared that fall, but I had a piece of ground that I broke up in the spring and planted with potatoes, dunging just enough to scare out a crop, and I selected that spot to scatter this seed; plowed in the manure in the fall, according to his directions, and let it lie until spring. In the spring I put on fertilizers, and followed his directions as well as I could. From those two ounces of seed I raised all we wanted to use in the family, gave away some, and had twenty dollars' worth to sell in the market. The next year, I had to write to this good cousin, whom I had caused to speak that wicked word, tell him how it was, and that I must have some more seed. He sent me seed enough to sow one-eighth of an acre. I took this same ground with the addition of some more, in a better state, fertilized it, and sowed my seed. I realized from that eighth of an acre not far from $200 in cash. Then, being one of the trustees of the Agricultural Society, when we began to talk about premiums, Mr. Gilbert and some others said, "Mr. Millett, what do you say about onions?" I said, "Give a premium for the best quarter of an acre of onions in the county." I took part of this eighth of an acre, lengthened it out with a piece of wet ground, which was pretty full of weeds, and made it smooth, like a wheat field. Then I went into my barn cellar and hauled out—you must not be surprised, a man who would raise a great crop of onions must feed them—six cords or twelve loads of manure. I put that manure on to a quarter of an acre, a year ago this last fall, spread it, beat up the lumps as well as we could, and plowed it I think, from five to seven inches deep, plowed it as well as it could be done possibly. It laid through the

winter, and last spring a cultivator, with a weight, was put on, which cut it up about five or six inches deep, pretty mellow. Then we hauled on twenty-five bushels of good dry ashes, spread them as evenly as we could out of the cart and harrowed them in. We thought then that the ground was hardly rich enough, and we put on forty bushels of hen manure, well pulverized—but it was not done as well as it should have been. I took the committee there, and they measured one rod, and found thirteen bushels and eleven and three-fourths pounds on the rod. But they were to take a quarter of an acre, and they put on the town chain and measured the piece. I had sowed a large quarter of an acre, but they had no right to take more than a quarter of an acre. They pulled up, weighed and measured row after row; skipped two or three rows, took a row, and then took another one, went over the piece as accurately as they possibly could, and when they made up their figures they found three hundred and ninety-two bushels on that quarter of an acre of good merchantable onions, fifty-two pounds to the bushel. The soil is a pretty deep loam, with a gravel bottom; hard wood ground—maple, beech, birch and hemlock. The wood was cut off nearly a century ago. I have been there thirty-seven years plodding along on that farm.

The reason for preparing the ground in the fall is, that you have not got so much to do as in the spring, and you can therefore get at it earlier than if you had to do all this business in the spring. Onions want to be sowed early. As soon as the ground is suitable, so that it will not stick to the seed-sower, put in your onions.

Another thing I will mention which may be of advantage. The rows want to be run straight, and I made a marker with four teeth, stretched a line, set up stakes and let one of the pins run near that line. After that I could get three rows at a clip, and get them very straight. The advantage of having them straight is, that you can hoe close to the onions and therefore save a great deal of weeding. There is another important thing. When the onion gets up two inches high or more, when the maggot begins to work, is the right time to sow three bushels of Liverpool salt to the acre. It should be sowed on a moist day.

QUESTION. Is that the only protection against the onion worm that you use?

Mr. MILLETT. That is the main thing, besides the thumb and finger. The grape worm is apt to trouble them, but they are very easily killed. There is no way to kill them except to follow them

right along. The land is so highly fertilized that it drives the onions beyond them.

QUESTION. Do you roll the field?

Mr. MILLETT. No, sir; leave it level and smooth.

QUESTION. Do you plant the Weathersfield?

Mr. MILLETT. No, sir. I plant the Yellow Danvers. We ought to raise our own seed and get the right kind of onion. This present season has been a bad one; the seed has not matured. I found a wheel-hoe at the Ames Plow Company's with one shank to it, fixed so that it can be adjusted to a tall or a short man. You can go over a couple of acres in a day. It goes in advance of the man like a wheelbarrow. Year before last I sowed the 19th day of April; this last year, the 1st day of May.

QUESTION. How wide apart are the drills?

Mr. MILLETT. Fourteen inches apart; four pounds of seed to the acre. They allow half an inch apart. When the ground is highly manured, they do their own thinning; they crowd out, and ride up on top of one another.

QUESTION. You weed before the weeds get started much?

Mr. MILLETT. I never pull any large weeds amongst them. We take all the little ones.

Mr. Z. A. GILBERT. Mr. Millett has made it appear just as plain as the nose on his face, that every man here can go on and raise three hundred and ninety-two bushels of onions on a quarter of acre; but I presume if we should go home and undertake to do it, nineteen-twentieths would fail, and consequently we should be discouraged. The fact is just here: In order to raise one of Mr. Millett's crops of onions, we have got to have Mr. Millett's keen eye; we have got to have either his or some other man's manure heap; we have got to have his pluck and his untiring energy, and we have got to work the whole thing into the soil before the onion crop will grow. We cannot all of us do it.

THE PRESIDENT. In answer to that I will say, that Mr. Millett has made it as plain as the nose on his face that the representatives of the farming interest of Maine are here in numbers sufficient to go home and exert an influence that shall do very much towards supplying the State of Maine with all the onions we require.

Mr. WOODMAN. I only want to say that we suppose we are the smartest Club and the oldest Club in the State of Maine. I hold in my hand a certificate from the Secretary of the Club, stating the date of the establishment of the Club, the number of mem-

bers now living, the names of the officers, and their post office addresses.

Mr. C. H. Cobb of Poland. I would like to say a word before I touch upon the Farmers' Clubs. I have been acquainted with Mr. Millett for a few years past and knowing how well he had succeeded in the onion business, I really caught the fever myself. I got some seed from his own raising, and tried the experiment. I prepared the ground last fall just as well as I knew how, according to the directions I received from him; I sowed the seeds as early as possible, and I must say that I think every seed came out of the ground and grew well until the plant was about four inches high. I anticipated that I was going to equal Mr. Millett's crop, on the quantity I sowed, which was but two rods square. I visited them every day and kept all the little weeds down so as to have no large ones. One morning I went down to the spot and about half of them were gone. I looked around and found they were lying on the ground; they had wilted and died, probably, the day before. I felt discouraged. I hunted then for the maggot, as I knew Mr. Millett had done the year before, and spent a great deal of time in digging the ground over with his hands, killing every maggot. I did so for a while, but I got discouraged after working all I cared to that day, and left it until the next day. The next day I had twenty or twenty-five stalks left. Said I, "Die you may and die you must; I won't trouble you any more." I raised three pecks of onions this year from what I had left. I feel somewhat discouraged about trying it another year, and I fear that will be the result with many farmers here. I will let Mr. Millett raise the onions and buy them of him,—if he will not give them to me as he did before.

I am here to represent the East Poland Farmers' Club. Our Club was formed April 6, 1870, and since then we have held meetings regularly once a week, nine months in the year, letting three months of the summer season pass as vacation. Our meetings have, we trust, been of interest to those who have attended. Our territory only comprises two school districts, and our number is small. We have thirty members who attend very regularly. Nearly every person is present every evening unless a bad storm or something of that kind occurs.

The main question which we have discussed this winter is how we can make our farms pay best. A good many are getting discouraged and think that their farms have got to the point where

they can no longer get a living on them and they must sell them or go on the town farm. The question for us to decide is, whether we will try to improve our farms or let them go for what they will bring. This question was discussed four evenings, and those men who were discouraged finally concluded not to sell their farms, but to hold on to them at least until next year.

Mr. COLBURN. I would like to ask the gentleman if he put the same kinds of fertilizers on his onions that Mr. Millett did on his?

Mr. COBB. I will simply say, that I put on barn manure, ashes, salt, and hen manure. I had as large a pile of hen manure as friend Millett, and I did not put it on sparingly.

QUESTION. Did you sow as early as he did?

Mr. COBB. I presume I did, for I think my land is a little earlier than his. I sowed just as early as the frost was out of the ground, being all prepared the fall before.

QUESTION. Did you put the dressing on in the fall?

Mr. COBB. Yes, sir, all except the ashes.

Mr. ———. We see that there may be very different results from precisely the same treatment, from other causes. I would ask Mr. Millett whether his land was exposed or sheltered.

Mr. MILLETT. It was exposed.

Mr. COBB. So was mine.

Mr. MILLETT. My friend said, "keep your onions away from where cabbages have grown for a year or two; cabbages and onions do not agree." Some may undertake to raise onions and I hope they will all succeed. It seems pretty plain to me.

THE PRESIDENT. I think we shall all agree, there is something in knowing how, and no one man can know everything and do everything.

Mr. L. GILBERT. I wish to say something in relation to the onion business. Many years ago, when I went on to a farm, I had very good courage. I could sow onions and get about two bushels where I can get one to-day. They grew splendidly. I used to sow the "silver skin" variety, and could raise a beautiful crop every year. At length I found there was a little fly that deposited a bunch of eggs on the plant, and in three days from that time, the plant was dead. It wilted one day and the next it was flat. I followed that matter up for some years; I could raise scarcely anything. I wanted to defeat that fly in some way or other.

This was at a time when we were raising sheep and making cloth for our own wear, and I took it into my head, in cleansing the wool, to save the water. Well, to make it more offensive, I let that stand in hot weather just as long as I dared to from the smell, and then put it on my onions which had just begun to form, and they started and grew, and my bed was covered with as handsome onions as ever grew. I was sure I had found a preventive, and I thought I had got a secret. The next year I took the same course exactly, and I got but four onions. After that we came to the conclusion that we could not get any crop. But having got acquainted with Mr. Millett, he almost insisted on our taking a few of his seed, and we did and planted a patch, and contrary to our expectations we raised some perfect onions. There seems to be something about him which enables him to raise this crop; whether it is his energy, perseverance, or what it is I don't know.

Mr. H. A. GILBERT of East Turner. We have a small Club at East Turner, keeping up our organization, following up our meetings, having our fairs and shows annually, and doing a good business. Our meetings increase in interest constantly.

Mr. LORIN ADAMS of East Wilton. The East Wilton Club is as interesting this winter as ever. We have just commenced our meetings—rather later than usual—and the interest was never greater than at the present time. We have adopted a little different course, and perhaps it will prove to be a great advantage. We have admitted a younger class to membership of the Club, male and female, and a share of the exercises is appointed to them. They come in with declamations and recitations, and, so far, it has proved a success. The Club numbers over one hundred and twenty-fifty, and we have over one hundred active members. It was never in a more prosperous condition.

Now, in regard to the Clubs I have visited. I intend to visit every one within the limits of our Agricultural Society, but I have been prevented from visiting some of them by the weather. The Farmington Club is perhaps no more prosperous than it has been in years past. May they revive, so as to do better.

A new Club was organized in Industry about two years ago. I spent one night with them, and never visited a Club which had been in existence no longer than they have where more interest was manifested. Their numbers have increased, I learn, since I was there.

The next I will take is Chesterville. They have an active Club, which was formed two years ago, and now numbers about forty, all intelligent, good men. I do not see any reason why they may not have one of the best Clubs in Franklin county.

I will now swing round to Jay. The Club there has been rather at a stand-still, but gives promise of a good winter's work. In North Jay they have been discussing the question of building a cheese factory, and the interest in the Club meetings is not, perhaps, quite what it has been some winters; but they have good material to work with, and they will have a prosperous Club. Mr. Foster, a representative of the North Wilton Club, is here, and able and willing to report his Club.

Mr. FOSTER. The North Wilton Club, which I represent, was organized a year last March, by Major Adams, with twelve or fifteen members. We have now some sixty members on our books, about twenty-five of whom are active and usually meet with us. Our members are nearly all from two school districts, most of them from one district. We hold meetings from September to April, weekly, usually. Our meetings have been very beneficial in forming habits of study amongst the members. There has not been time enough since our organization to make any marked changes in our methods of operating or conducting our meetings, but I believe the foundation has been laid for much improvement in the future, and not far off, either. We held a fair last fall in connection with our Club, which was a success; and although the amount of material was not as large as I have seen at town and county shows, still it came very near being as much as they sometimes have at such shows and was fully as good.

Mr. SAMUEL SMITH of Litchfield. We have a Club which I represent in the town of Litchfield. Last fall, we held our fourteenth annual cattle show and fair. Our members have been constantly increasing since the organization of the Club, and I think it has been the means of doing much good in awakening the interest and enthusiasm of the farmers in that vicinity. We have something over a hundred members. Our cattle shows and fairs are not restricted to the members of the Club, but embrace the whole town, which is quite large. We make no distinction between the members of the Club, and those outside of it, but in getting up these fairs we put in gentlemen of the town who are most suitable for officers. We usually succeed in drawing out a very large

number of people, if nothing more, and generally have the praise of having something worth going to look at. Last fall something like five thousand people were present. We have very good grounds on which we hold the fairs, with a half-mile track enclosed in the fair grounds. We have had very little to do with horse trotting, but there is a track, and those who choose to drive upon it do so at proper hours through the day.

I will say that we do not hold meetings the year round. We have our annual meeting of the Club, when the town's people meet with us, and we usually hold Club meetings in the winter season, not always where the whole town can attend, as it is some six or eight miles across the town. So we have some neighborhood clubs that meet in their district school-houses, and discuss such matters as they think proper. Sometimes the whole town meet together at the town house. That is the way we have been in the habit of conducting the exercises of the Club, and we think with much profit.

Mr. DUNHAM of Bangor. The organization which I represent is the Penobscot County Agricultural Society. It is an organization just formed, for the purpose of bringing delegates from the whole county together, to discuss what the different Clubs are doing in the different parts of the county. Our officers consist of a president, secretary, and vice presidents, composed of the presidents of the various county societies, the secretaries of the different Farmers' Clubs in the county forming a prudential committee. We hold our meetings by invitation of the different clubs. They send in their invitations and we hold our meetings where they will make the best provision for us. I think this new organization will be very beneficial in bringing the Farmers' Clubs together.

Mr. WOODMAN. The Club of Minot, which I have the honor in part to represent, is anxious to know if we are the oldest and largest Club in the State. The gentleman who has just reported for the Litchfield Club has not stated the date of its birth. I would like to have him give that.

Mr. SMITH. I was out of the State when the Club was organized and have not the date with me. I think the organization dated back some years previous to our first holding our shows, which was fourteen years ago.

Mr. HASKELL of Poland. The question has been a good deal discussed, as you have heard from Mr. Cobb, how to make our

farms pay. I have heard a good deal about cheese factories and I came here hoping that I should find some one interested in the business who could tell me how well it paid. It looks to me from what I have learned, that we can make our business pay better if we can sell our milk to a cheese factory for eight months in a year, than by being confined to the business of selling milk the year round, as we should then have four months to rest and look after our other business. I feel very anxious to get all the information I can in regard to the cheese factory.

Mr. O. HOWARD of Winthrop. Our Club, the West Winthrop Farmers' and Mechanics' Club, has been in operation some two years. We formed our organization by inviting the people of our town to meet in convention for the purpose of forming an agricultural club. When the meeting was held, we formed suitable rules and regulations, providing that we should have a president, secretary, assistant secretary, and committee of arrangements. We invited every man and woman to be present, if they saw fit, and when they were present, they were members of our Club, for we intended to be very democratic. The expenses, which are very few, as we meet at private houses, are defrayed by contributions. Our chairman is chosen at every meeting; he decides all questions of order, and calls the next meeting to order and presides until a new chairman is chosen. We thought this would create an interest, as every man would feel that he was liable to be called upon to preside, and would be anxious to prepare himself to meet the responsibilities of the position. We consider ourselves, therefore, very democratic in our organization and in our practice, and we have succeeded in creating quite an interest. I believe there is another Club in the eastern part of the town, but I am unable to give any particular information in regard to it.

Mr. A. C. CARR of Winthrop. Our Club is not quite so democratic as the one in the west part of the town, because we elect our president once in four weeks. So you see they are just four times as democratic as we are. We thought that was often enough. Our Club was organized just before their's was. We have thought we were pretty smart, but this season there has been so much going on, that we have not come together yet. We have been having two lyceums, one in our district and one in the next district; a singing school, two writing schools in the vicinity,

and religious meetings more than half the time, so that it has not been thought advisable to call a meeting of the Club, but I expect we shall be called together soon. Our meetings have been very well attended, and those who read the Lewiston Journal will remember some reports last winter and the year before, from our Club, and I am in hopes that our Club will be equally good and that we shall compare favorably with our brethren in the western part of the town.

Adjourned to half-past one o'clock.

AFTERNOON SESSION.

The Convention met at the hour appointed, Mr. Z. A. GILBERT in the Chair.

On motion, a vote of thanks was tendered to ALEXANDER HYDE of Massachusetts, and JOSEPH B. WALKER of New Hampshire, for their highly instructive lectures. Also, to the citizens of Winthrop for their courtesy, and the assistance rendered by them in promoting the objects of our meeting; and to the citizens of District No. 4, for their kind invitation and entertainment at the dedication services of their new and beautiful school-house.

A paper presented at the Winthrop Meeting of the Maine Board of Agriculture on

GREEN CROPS A READY AND AVAILABLE MEANS FOR ENRICHING THE SOIL.

BY SAMUEL WASSON, MEMBER FROM HANCOCK COUNTY.

My theme, "Green Crops a Ready and Available Means for Enriching the Soil," has not enlisted the attention of our farmers, or secured their practical commendation. The time has come, when the importance of feeding the land with *green crops* should be fully appreciated. The various ways of preserving and applying stable manures—the standard manure of this country—fail to preserve an undiminished fertility of the soil. Statistical tables show, that the average yield per acre, is on the wane. In New York State, since 1844, in corn, the decrease is nearly four bushels per acre; in wheat, two bushels; and in potatoes twenty-two and one-half bushels.

While the barn-yard must always be the farmer's main source of supply for enriching the land, he who is wise will avail himself

largely of the cheap means which green manurial crops afford, to check that retrograde movement in the process of agriculture, and the lessening crop per acre.

I.—*What is Green Manuring?* It is the plowing down of standing crops, both annual and perennial, just before the plants arrive at perfect maturity. The period at which this should be done is just when they are coming into flower, for then, they contain the largest quantity of readily soluble matter, and have not robbed the land of that nutriment with which they are intended to supply it.

This mode of feeding the land does not claim the merit of novelty, or of modernized husbandry. The practice dates as far back as the time of the ancient Romans. The farmers of Belgium were the first, in modern times, to grow plants for such use. Having a population of four hundred and thirty-three to every square mile, to be fed, they had to resort to every expedient to stimulate their lands to maximum productiveness. As a result, the soil of Belgium—a loose and porous sand, poor and unproductive, like the sandy sea-coast of New Jersey and Maryland—has been made very fertile and fruitful. What irrigation is doing for Utah, green manuring has done for Belgium. In Germany, Italy, England, France and Canada, and in the "States," whenever or wheresover employed, it has proved to be a valuable aid, effecting a change in the soil, which no other fertilizer could produce so quickly, or so economically.

II.—*Is there need for such ameliorating crops?* The basis of a self-supporting agriculture, is a system which shall be able to give back to the soil what is taken away and lost, in the process of cropping. It is within the historic period, that nations have perished in consequence of impoverishing their soils. Countries on the Mediterranean shores, filled with the civilization of antiquity, and formerly possessing a very dense population, and opulent cities, are by their miserable failures in fostering that industry which provides the national bread, shorn of their ancient splendor, and are on the railway to decay.

As show by the last decennial census,

> The broad stripes and bright stars waves its folds
> O'er thirty-nine million bread-eating souls,
> Who eat of bread, whether they earn it or no,
> Which one in six of their number grow.

This Census Bureau light shows, that 83 per cent. of the farm products are consumed by non-bread growers, miners, mariners, mechanics, merchants, manufacturers and middle-men, have the "physical constants," of appetite and hunger, in common. However widely different are the gods they adore, they are all in accord in doing homage to the handiwork of Ceres. According to the ancients, each tree had a Nymph that cared for and protected it; but according to the moderns, 83 per cent. of the soil's food-giving elements, are sacrified to satisfy the cravings of appetite, and but one pound in six is returned to care for the acres, or to feed the land which feeds the nation; while the arable land *must* feed the millions who grow the bread, and the millions more of bread-earners and bread-eaters, will such as can "see through a mill-stone," divine how fertility is to be preserved, and impoverishment averted?

A fair yield of wheat is said to take from an acre of land about 174 pounds of ash constituents, oats 156 pounds, potatoes 140 pounds of potash, a ton of clover 156 pounds, or 40 of potash, 11 of soda, 56 of lime, 80 of silica, 9 of oil of vitrol, 13 of phosphoric acid, and 7 of chlorine. Every crop exported to feed the other activities of life, takes with it a known quantity of the fertilizing elements, of which every five pounds in six are lost virtually, and of the sixth pound, supposed to be returned to reinvigorate the soil in the form of barn-yard manure, there is a loss of the *liquid half*, so that really but one pound in ten, of the ph sphates, potash and ammonia, of which the soil is despoiled, is returned to checkmate exhaustion. It is said that in a single year, we exported from the fields, more than 422,000 tons of their ash-constituents, *in the form of grain.* With such a drawing upon their fertility the time must come, when even our virgin soils and "boundless productiveness," will, by a law as inevitable as gravitation, find a limit to their endurance. Plants are not formed of newly created matter. The atmospheric supply is the gift of Nature, but the soil supply is a loan merely for the season, to be repaid in full measure. Were the fields gifted with language, their "maiden speech" would be, "pay me what thou owest, for our resources are not inexhaustible." Liebig says in his "Modern Agriculture," "when the field of the American farmer ceases to yield him sufficiently abundant crops, he simply quits it and betakes himself to a fresh field, for there is plenty of good land to be had in America."

The most accurate possible estimates show the average alien influx into this country for the past eighty years, to have been 256,000 souls, or equal to that number per year. In one decade, the tide of immigration poured in from Ireland and Germany alone, 2,750,000. Within four decades this immigrative increase with the soil's *imminutive* decrease has

"Its ruins o'er the regions spread,"

and pushed the central wheat line more than 1000 miles westward. The same increase of population continued, in forty years more, will swell the number of mouths to bread, from 39,000,000 to seventy and a quarter millions, and other influences being equal, will push the "wheat line" from its present meridian (Wisconsin centre) far beyond the "dome of the continent." Couple on to these a suicidal agriculture, and the German chemist might amend his assertion of "plenty of good land in America," as he before amended another in his favorite Mineral theory.

The weight of testimony is, that there must be a returning to, as well as a taking from, the soil. But the work of replacing by the rut-worn way of carting on—a labor not imposed by the process of green manuring—is one of immense magnitude, if as chemistry through Dr. Nichols as proxy, says, "that all the active fertilizing matter in a cord of barn-yard manure, can be put into a bushel basket, or that but 74 pounds in every 3,000 pounds, are really valuable." Whether this be practical truth or scientific *bosh*, it *is* true, that the producing power of soils must ultimately fail, unless a method of feeding them radically different from that now pursued, be adopted. This is what the introduction of green crop feeding promises to do.

III.—*Which of the green crops are best?* In European husbandry those regarded as best, are turnips, clover, corn, vetch and mustard. In the cool and moist climate of Old England, the turnip grows to perfection. It is rated as the best green crop and as a staple product is only exceeded by wheat. In the hotter and drier climate of New England, it is spongy, dwarfed and uncertain. Its climatic extremes and ravaging insects forbid the turnip a leading place in American staples. The turnip belongs to the cabbage family, but unlike the cabbage, delights in a sandy or a calcareous soil, and in wood ashes for a feeder. Its large, rough, spreading, and gas collecting leaves draw a deal of nourishment from the air, which make them valuable soil-renovating crops, and

as such they have been used in Belgium, Holland, Germany and England with very great advantage for several centuries. For Maine, the best known substitute to take the place of the turnip, is the *mangold wurtzel*, a species of beet.

The vetch said, by some, to be the "tare sowed by an enemy" in Bible times, and by others, to be the identical American wild pea, has in Germany and in England, been found to be of great value for plowing-down. The vetch or tare, belongs to the leguminous order. Its place is somewhere between a pea and a bean. It is an annual, having a spring and a winter variety, both of which are hardy and productive. It grows well on any soil that is not dry. It is sown like wheat and yields two crops like clover. As a forage, its effects are magical on the coats and condition of horses and refreshing to cows which have fared hard in winter. It is a precarious plant in this country as it suffers severely from the ravages of bugs.

Red Clover, in those of the old countries where farming is conducted as a business, is highly prized as a green manurial plant. Both in its green and dried state it contains a large proportion of lime, magnesia, potash, carbonic, sulphuric and phosphoric acid, chlorine and nitrogen. Its great celebrity as a manurial plant is, first, its stems and leaves absorb much and most of its fertilizing gases from the air. Second, its long, thick and strong tap roots, draw the fertilizing saline and mineral elements of the subsoil up into the surface soil. A still further excellence it has—that it is the cheapest and the easiest agent to supply soils with available nitrogen, the "scarcest and dearest of manurial elements."

The chain of hard and discouraging clover-years in Maine, with the uncertainties of catch, and its certainty of winter-killing, have not made clover

"One of the blessings of the farmer's lot."

Were farmers imbued with a sufficiency of faith, to believe that plowing down clover is one of the best preparatory operations for

"All the products of the fields,
All the stores the garden yields,"

it might overcome their fears, and induce "plodding industry" to run a risk in clover lays, even if it fails three times where it succeeds once.

In New England, the green crops which have been tested and prove to be the best for enriching the soil, are clover, buckwheat,

peas and rye. Of clover, nothing more need be said than that but few plants equal, while none excel it.

Buckwheat *(Polygonum fagopyrum)* is presented as a precious plant. In fifteen years of its cultivation, the instance of insects injuring it has not occurred. Cultivation has been recommended to kill Canada thistles, for it is reasoned that frosts, floods, droughts, bugs and worms, then would move forward in the work. By the same reasoning, the extensive culture of buckwheat may learn new tricks to old bugs, or vivify fresh ones. Buckwheat contains in its straw considerable quantities of lime, magnesia, potash, soda, phosphoric and sulphuric acid; hence its value as a green manure. Analysis shows one-half of its ashes to be phosphoric acid, that so valuable a soil constituent. It is a rapid and hardy grower, adapting itself to any soil, from drifting sand to impact clay, and can be successfully grown on the same ground for years in succession like onions, without exhausting the soil. To smother and eradicate foul and noxious weeds, or to conquer witch-grass and thistles, it has no superior. Its habits, like those of the sunflower, indicate a hygienic value as a purifier of the air we breath, correcting the effluvia and miasma rising in the atmosphere from sink-spouts and sloven spots of the farms.

The horse epidemic, with its mouth-splitting name *(typhoid laryngite)*, which made its appearance so simultaneous in all parts of the country, followed by an unheard of prostration of the horses, presents a striking and vivid exhibit of how extensively and fatally the germs of malaria can infect the air. Luckily for the horses, it was the epidemic and not its name which attacked them. The disease they may survive, the name would have been fatal.

Of buckwheat, there are two varieties; the rough, having a yellow blossom, quite obscure, and the smooth, with white, expanding flowers. The rough is known as "Indian wheat." To attain to the full benefits of this plant as a manure, it ought to be sown early, top dressed with lime or plaster, and plowed down when in full bloom. Two crops of it can be grown and plowed down on the same ground the same season, and the ground seeded down with grass or a winter grain crop in September. A small quantity of seed, costing very little, sows a large surface, gives a good crop, and when plowed down, decomposes rapidly, loosens the soil and forms good manure. It is a marvel why, for domestic use, it is so limitedly grown. It yields about fourteen pounds

of flour to the bushel. As a poultry food it will bring the cackle in winter. A French writer says, "We cannot too much recommend the employment of this precious plant as a manure."

The *pea*, which most farmers grow with potatoes, without benefit to either and detrimental to both, is of great value as a green manurial crop, even after the ripened fruit has been gathered. The vines or haulms contain a very large proportion of lime, potash, carbonic acid, and chloride of sodium (salt), and considerable of phosphoric and sulphuric acid, magnesia and soda. The pea crop is a good weed destroyer, and when plowed down, puts the soil in a fine condition for wheat.

Rye is considered the best of all green manures for sandy soils, but for most soils it is too expensive, and too valuable a grain. Its best place is as a crop to follow wheat. A German physician, (Thaer) says, "unbolted rye bread has a singularly strengthening, refreshing and beneficial effect on the animal frame."

If "refined" society could endure rye-and-Indian bread, and pea broth, there would be less of those modern appliances, dyspepsia and neuralgia, and concomitant ills, which hot flour cakes and melted butter, have crowded in to curse mankind and fee the doctor. If no one thing was made in vain, why

> Cannot the noxious weeds,
> Be made to do obliging deeds?

Why may not the buttercup, charlock, rag-weed, ox-eye daisy, burdock, pig-weed, barn-grass, and their name is "legion" of plants out of place, which by being plowed down, might be made to subserve a useful purpose. What tangible reason why such may not be,

> As green crops used and seen,
> To "array the fields in living green?"

When to plow down green crops, as has been said already, is when they are coming into flower. At this period the plants are in a sufficiently unripe or immatured condition, to take on a quick decay. The work of plowing-in should be done in the heat of summer, if possible, while the sun has the power to forward the fermentation or rotting of the crop.

The how, is to roll down the crop when the dew is on it, running the roller the same direction that the furrows are to be made. If the full beneficial effects are to be realized the following year, the plowing should be not more than three or four inches deep.

It should be thoroughly done so as to leave no part of the vegetable mass sticking up and out between the furrows. To this end, a chain may be attached to the off-end of the whiffle-tree or with an ox-team, to a stick bolted to the plow beam, and the other end hitched at the beam-standard; this will draw the plants into the furrow. Complaint has been made, that an abundant crop plowed in when the weather was wet and hot, is excited to so active fermentation that it acidifies the sugary (saccharine) matter and sours the land. A broadcasting with lime, salt water slacked, at the time of turning-in, will remove the risk.

IV.—*Why specialize certain green crops as remarkably beneficial for enriching the soil?* A general answer might be, because such are vegetable or organic matter, which make a soil friable, active, and fruitful. The soil of the southwest has a thick sponge-like covering of vegetable matter or mold, and therefore is rich and fertile, because the vegetable mold contains within itself the elements of fertility, and also drinks in or absorbs air-food and stores it up for the sustenance of growing plants. The thin coat of vegetable mold which was spread over the surface soil of the northeast, like a covering of snow, long since was taken off and sold in the market, hence the soil is shallow and sterile. Abstract the vegetable matter, or humus, to use a technical term, from the fertile savannahs of the south, or from the rich alluvial soils of the west, and the sands of the desert would be no more worthless.

To supply the loss, the disrobing of the soil of its vegetable covering is the special office and function of green crop manures, and analytical and practical tests show that clover, buckwheat and peas, being remarkable absorbers of air-food, afford the most ready and available means.

That universal law of nature, which divides the animal kingdom into grass eaters and flesh eaters, separates the vegetable world into air feeders and earth feeders. Those plants, gifted with power to absorb the elements of organic life from the air, and deliver the same to the soil for the use of succeeding crops; that is, which leave the soil better than they found it—an operation analogous to the increase of moneyed capital which yields an annual interest—are denominated "air-feeders," and such are clover, buckwheat, peas, beans, and a few others. Among the trees, the pine family which includes the spruce, juniper, hemlock and cedar, are classified as air-feeders. These require "anchorage ground" only—a spot whereupon to stand—sending out horizontal roots

near and often above the surface, at nearly right angles with the trunk, forming knees and foothooks, so valuable to ship-builders. The pine and spruce are almost entirely combustible, the pine leaving in ashes but one five-hundredth part, while in the ashes of the spruce scarcely a trace of potash can be detected. The deciduous beach, birch and maple, send out vertical roots, reaching far down into the hard pan, to find food originally in the subsoil, or which rain, snow and frost, have leached out of the surface soil.

The difference between air-feeding and earth-feeding plants, is a difference in degree and not in kind. In burning a plant, the greater portion of it is dissipated in the process, or driven off in the air, in the form of gas. Generally, only from three to ten per cent. is left and this is in the form of ash or ashes. In one hundred weight of hay, ninety-seven pounds are destructible by fire. In one hundred pounds of burnt wheat, but five-fourths of a pound are left in the ashes. From eighty-seven to ninety-nine and nine-tenths per cent. of all cultivated plants are derived from the aerated atmosphere above and around us.

The part which the farmer has to act in the matter of air-food, is to induce the atmosphere to donate liberally. Warped and distorted facts have been impressed to prove, that the quantity of food annually dispensed by the air is a *constant*, regardless of the efforts of man, but the process of plowing down air-food plants, shows conclusively that the quantity is variable, and that the supply can, by artificial means, be increased.

Chemistry says, and its saying is not reversable by practice, "that carbon, a solid and issoluble in water, and which forms the larger frame-work and bulk of plants, is supplied by the air." The amount of carbon drawn from the atmosphere in the state of carbonic acid, (carbon united with oxygen) and ammonia, are very great, and may be greatly increased by plowing in such plants as clover, buckwheat and peas, which, in the act of decay, render the soil more greedy and actively absorbing. The surface of a soil destitute of vegetable matter is as nearly air-tight, or air excluding, as the glass vessel of a "*Cartesian devil*" covered with India rubber. All over New England do the worn out vegetable robbed farms elucidate this truth. Many a plausible but delusive theory regarding plant-food, its source and office,

> Turning and swelling, high and hot,
> Like liquor boiling in a seething pot

has been promulgated; and for a time has narrow-guaged the

course of manuring, until practice has "pricked its bubble." The "*Humus* theory"—rated for a while at twenty-four carat fine—taught substantially that the chief aim of the farmer should be, to provide abundant supplies of organic matter, disregarding a provision of mineral elements, lime, potash and bone earth, because nature had given to the soil an inexhaustibly available supply. This theory, a success on paper, was a failure in practice. It is an accepted fact, that the tobacco district of Virginia became unfruitful, not by loss of its humus, but its alkalies.

After the humus theory had its day, came the mineral theory, like "one in the wilderness crying aloud," that the secret of fertility was hid in the earth, and *marabile dictum*, it possessed the gift of analysis to find it. It claimed that if the presence of air-food in the soil was not accidental, it was immaterial, for the real pabulum, that which feeds the plant, were the mineral elements, all else were extraneous matter. But when put to a practical test the bottom of the phantom dropped out. The combined theories, like a *pseudoscope* made each eye see separately. On one eye fell the reflected image of carbon and nitrogen; on the other that of potash and lime. The iron monuments which spot the Northeastern Boundary Line, on the English side, are inscribed, "erected by Lord Ashburton," and on the American side are inscribed, "erected by Commissioner Daniel Webster," so the monument set up by these two theories, on the humus side reads "air-food is the true pabulum of plants," while on the mineral side it says, "it is earth-food and that alone." Like the two assumptions in Double Position, the "sum of their errors" were resolvable into entire correctness—that all of the elements were essential constituents. These theories in wedlock gave birth to the "four-course" system of England and solves why the Belgians who continue the system of green cropping, are to this day the model farmers of Europe. Experienced farmers know that a good yield of hay after oats, or of corn after potatoes, are exceptions to the rule; and full well they know, that to prevent the yield from lowering from medium to bad, and to arrest the progress of sterility, the antidote is in an increased supply of fertilizing agents.

Beecher said of the Boston fire, "The flame gave out a puff of the lip, and buildings that seemed to be as lasting as the pyramids, have melted like wax." In like manner the imperfections of our farming have given out a puff of *its* lip, and soils that seemed to

be as lastingly fertile as the valley of the Nile, have become as sterile as the rainless districts of Palestine. If "no man can take into conception the terrible ruin" of that Boston conflagration, how immeasurably less can he conceive the ruin which an exhaustive cultivation can achieve. The yearly grain crop of the United States removes from the soil 665,000 tons of mineral matter, of which the single element of bone earth, has a cash value of $90,000,000.

V.—*If green crops be an available means, why no sooner known?* The same shade of suspicion "why no sooner known?" with the same force and emphasis, might be thrown across every new idea, fresh discovery, real invention,

> "Which are wont to give
> Light to a world, and make a nation live."

The available means which green crops afford for enriching the soil, is no new discovery of doubtful utility. It belongs rather to the "lost arts," like that of malleable glass, which it is said after skill and science for hundreds of years of fruitless efforts to rediscover, has been found.

He whose hand wields the shovel, has a *blistering* reminder that the usual quantity of animal manure, with its bone and backaching task of handling, is not enough to feed the land. The hungry fields, the starving plants, the annually decreasing yield per acre, the horse-leach cry of "give, give, or else we die," are voluntary and willing witnesses of the available means which green manurial crops afford. The whole community of farms is nearing the time when, with their thinner soils and scantier crops, the product will be insufficient to pay for the labor. This is emphatically true where low farming prevails, and where it patters the "working-out" upon the highways, in which long loafings and short work is the rule, and "mending the ways" the exception.

There are many inexplicable things in plant-growth. One of its chief mysteries is, how upon the same plot of ground the grains and grasses, fruits and flowers, with their unnumbered varieties and every possible order of succession in which their forms and colors can be arranged, and so distinctively unlike, either in nature, properties, internal character or external form, should be composed of the same constituents, of which, those showing an appreciable quantity, are but twelve in number. How

these twelve—four from the air and eight from the soil—the carbon, nitrogen, oxygen, hydrogen, potash, soda, lime, magnesia, iron, sulphur, phosphorous, and chlorine, could be put into combination to form such an infinity of vegetable organisms, must be told by the Hand Divine, which made them. Every plant of perfect structure, requires a fixed proportion of each of the number. Each constituent must furnish its quota, "paper men" and "naval credits" not received. The share assigned to each, differs with different plants. Wheat requires four times as much magnesia, nine times as much potash, and thirteen times as much phosphoric acid as it does of lime. As reflected by the present light of science, the scarcest, dearest, and most indispensable element is nitrogen. It is an essential in the structure of every plant and animal, and by no ascertained method, can it be so cheaply transferred from air, to earth, as by the process of green manuring. The active part which nitrogen performs in promoting vegetal growth, is an enigma to the man purely practical When the common schools do the uncommon thing of utilizing the wasted time in "ciphering out" the *frog* that fell into the *well,* or enumerating the "kits, cats and wives, bound to St. Ives," by devoting it to a knowledge of the composition of plants and animals, or of the invisible gases, essential to the life of every plant and of every animal, or of the action of light, and heat, the causes of wind and rain; such a knowledge will teach the nature, properties and uses of the elements, and thus pave the way for the coming meteorologist "to forecast the weather and the seasons for the farmers, as well as the storm and tempest, for the mariner." Such a course of study would give a class of farmers, who could comprehend the nature of nitrogen, its use and its action. Such a knowledge would light up the way, in which green crops decaying in the furrow, give out nitrogen, so admirably prepared to fertilize the soil; how it accomplishes its appointed work unseen, but surely; ever enriching—never exhausting.

As it has been found that certain plants possess the property, in an eminent degree, of assimilating and storing up in their roots, stalks and leaves, more nitrogen than is required for their own use, and retain the excess left over, for the use of other plants, farmers can, by plowing down such plants, supply this beneficial and high-priced element, cheaper than by any other way.

It has been said that "God never made the world to wear out,"

but he has made men who have become Ajaxes of destruction, nature's sternest foes, and the worst. The atom which one man can wear and waste, seems of little consequence. While the field cuts less hay and the pasture carries less cattle, the *less* which represents the wearing out of fertility, is regarded as too trifling to notice; the moiety of nitrogen, potash, and phosphate, delivered in the market, in the beef and butter, eggs and oats, may be considered as unworthy the notice of any grown man. Small as may be the contribution of each person, it is a contribution, which in the aggregate of "strip and waste," looms up to a fearful figure.

Napoleon said that "figures is a budget of things." Let us open that budget and see how "Freedom's Land" is wearing out. The New York railroads transported a total tonnage of agricultural products, from 1860 to 1871 inclusive, of nearly twenty billion tons, yet her transit routes are unequal to the demands of Chicago. In one year the traffic of farm products over three lines of road, was more than five million tons. By the Erie Railroad Company, were shipped at Chicago and delivered at the elevators or on steamers at New York, from January to June, 1872, five and a third million bushels of grain. With the enormous carriage over the railroads, the canals transport more than the roads. A large part of the grain which Chicago handles, goes by the St. Lawrence river route, which is nearly one thousand miles nearer to Liverpool than by the way of New York. In 1871, the grain commerce of New York was eighty-eight millions of bushels, which was but 45 per cent. of the entire trade, so that the total carriage over all routes was one hundred and ninety-seven millions of bushels. Add to this, one hundred and twenty-five ship loads sent to Great Britain from San Francisco, with fifty-six ship loads in warehouses awaiting shipment, and this, to the home consumption, gives an annual aggregate of 1,380,000,000 bushels or 665,000 tons of ash constituents removed from the soil. Let him who is quick in figures, tell what extensive tracts, what vast areas of arable land, the removal of this enormous cereal treasure is wearing out.

The Live Stock Market reports show, the yearly average consumption of beeves, sheep and swine, in New York city alone, to be 2,759,850 head. When it is considered that every pasture-fed cow carries off yearly not less than fifty pounds of phosphate of lime, it may be seen why the pastures carry less cattle, and why

in old pastures cows chew bones. By this process of wearing out, the earth's diameter may not diminish, or its specific gravity grow less, but its productive power, which concerns us so much, is sadly impaired.

VI.—*Is to supply plant-food the sole office of green crops?* By no means, for they exert a physical influence, which give them an increased value. They make a clay soil warm, and porous, and light; and friable soils firm and tenacious. If the soil be hard, compact, or coarse, they render it mellow, loose, or fine, making the infinitesimal pores or spaces between the soil particles, more accessible and inviting to sunshine, moisture and air-food, thus opening new roads into the soil by which the tender rootlets—the feeders of the plants in pillory, can go off in all directions to seek their food. Not only do green crops afford the most inexpensive means to restore the necessary elements in which our soils have become deficient, but they act as a vehicle to retain and convey other enriching land food to the soil, serving as a sort of duplex or double transmitter, by means of which they do attract nutriment both ways, from the atmosphere and subsoil, to contribute to the wants of growing plants.

VII.—*How best can the use and economy of green crops be put to the test?* By Farmers' Clubs. These social club gatherings collate a great variety of information in the form most easily appreciated and are of great value. These associated efforts are of priceless value in promoting experimental farming, and in giving the "right hand of fellowship" to the every-day operations of farm life. The good talk—that healthy mind food—which the discussions at such club meetings call out, does not aim at the stars, but is kept to the level of interesting and instructive subjects, to the interchange of information and acquisition of new facts, or old facts, newly dressed on a given subject. The effect of such discussions rightly conducted, is to make each one's mind both a sieve and a mill, to select, assort and grind, the facts and theories presented, turning out flour or bran, for theirs and others use; and by the winnowing process of experience, sifting out such of these facts and theories, as are of the best quality. Hence such organizations become competent tribunals, to try the claims herein set forth in advocacy of enriching the soil by green crop plants; a court of inquiry, which will not exhaust its energies or

encourage evil-doers, by making loop-holes in the law, whereby criminality can escape the ends of justice. If such clubs would grow in usefulness, and not find themselves at the end of the year, no better and no wiser than at the beginning, they must go "marching along," increasing their usefulness by enlarging their field of action. In putting the use and economy of green manurial crops to a practical test, is an experiment worthy of their metal.

At the outset it was proposed to ask, and to answer, as a final inquiry, "*How best for a beginner with renovating crops?*" but the limits of this paper forbid it examination.

The method of feeding the land, which forms the subject matter of my theme, needs no underwriter to secure it success. The enterprise has no high rates or ruinous risks attached. It calls for no digging down to the foundation, to get at it, but is simple, inexpensive and common sense like, giving results which stifle cavil, and find new admirers. In the older States, such has been the routine of practical farming, with its conditions unfavoring the growth of wheat, and corn, and clover, with its partial lop-sided feeding of the soil, that in the expressive phrase of the miner, the "dirt don't pan well," thus reducing our farmers to the alternative of one of three choices, either to "quit the claim," live on the tailings, or feed the land better.

The call for something better to feed the land, to restore fertility, and give bounteous crops, caused an extensive business to spring up, in the manufacture of commercial manures, opening a field to knaves, quite as fruitful as that of the "Great Rebellion," filling the market with so-called fertilizers, not unlike the wonderfully "cancer-curing cundurango," which leaves nothing but empty pockets on the one hand, and plethoric ones on the other. The worst phase of this *imposture* traffic, is not that honest farmers are cheated, and recover not their losses, but is, in undermining their confidence where adulteration and imposition have not obtained, or in any system of fertilization, having the "freshness of youth," which could restore the soil of New England to a thriving and fruitful condition—that New England, whose brain-power "influences the destines of a continent, and is one of the civilized factors of the world."

Farmers in the main, who limit their efforts in feeding the land, to the measure afforded by the farm buildings, have a theory, that

whatever does not emit an offensive odor, is undesirable, and unfit for plant-food. Pigs, it is said, are the only creatures that can be happy without *a* theory. That the return to the soil, of at least three constituents of plant-food—whether they smell bad or not—is indispensable to continued fertility, may be regarded, as settled, since in every agricultural section of the world, where the use of potash, phosphatic and nitrogenous fertilizers, have been most extensive, there is to be found the greatest increase in agricultural productions. The use of green crops has made a garden of Flanders. The importation into Great Britain of guanos and bone fertilizers—an importation of 250,000 tons per year—has doubled the farm products of England, since the days of the Stuarts.

If *our* farmers would improve in the

"Art that calls the harvests forth,"

a soil, *well filled and well tilled,* must be their "counter-sign" and "pass-word." It is for the want of *that* system of high farming which has elevated the standard of agriculture in Germany and England; which makes our arable land grow barren, and the farmer's purse grow light. It is because we have cropped the fields of their available plant-life, that there are so many worn-out farms, with dilapidated buildings—spectres of melancholy—which speck the landscape. Our improvident feeding of the fields under cropping, has given impetus to the alarming exodus of the rural population, and discontent to *our* sons and daughters, who are forsaking home, kindred and friends, to seek nearer the Western sun for a "better land."

Our soil has not failed to "feed the expectant nations," because like Sampson, it has been shown of its strength. It has not been "worked out," like coal beds in England, or silver mines of Peru. The fields are not tired, but *hungry;* the soil is not weary, but *faint.* Its locomotive is destitute of available fuel. There is silica and potash enough, but one is insoluble, the other, the granite rocks hold fast. There is as much carbon and nitrogen in *our* air as in that which overspreads the wheat fields of the West, but the organic matter is wanting, with no green crops to re-place it.

When our farmers learn to imitate Nature, and to know what to do to restore the wasted energies of the once productive fields, and the different kinds of food that different plants require, and do that self same thing, then will the "magic circle" be unbroken,

and a bright vista of prosperity loom up in the future of our State. Then

> A farmer's arm the earth will mould,
> And "change a rocky soil to gold,"
> By giving Green Crops to the soil,
> And not its fertile life despoil.

Mr. L. L. Lucas of St. Albans, then read a practical paper on matters of direct interest to every farmer. We have not been favored with a copy for this report, but its general tenor may be learned from the following

Discussion.

The Chairman. The speaker has certainly been very entertaining in what he has said, and doubtless has awakened thoughts in other minds. Will Mr. Burleigh of Fairfield, entertain us with some remarks in reference to the value of shelter and good feed.

Mr. H. C. Burleigh. Our friend, Mr. Lucas, has gone over a very broad field, and has done his work nobly, as far as he has gone, and I think he has gone further than most speakers do. But if I can add in the slightest degree to the interest of this Convention, I shall be glad to do so.

I think Mr. Lucas has hit the nail on the head in what he has said with reference to raising good cattle, for those are the only ones that pay. As he says, the common run of two-year olds that are sold throughout the State will only average about $28.00 a head. I think he has set it high, even at that, as I have had something to do with buying and selling, as well as raising them. But with improved animals, we might bring the value up to twice that, with very little extra expense; for instance, if we start with the right kind of cattle, start from blood stock, which I believe is all-important. A good many people say they see just as many nice grades as thoroughbreds, and some even better; they must remember that those were stated from thoroughbreds. You must have a starting point. Whether you are feeding Jerseys, Shorthorns, or Herefords, you must have a starting point. And here let me add one word on a point which the speaker did not touch. All thoroughbred animals are not well-bred; there is a mighty difference between a well-bred and thoroughbred animal, and an ill-bred thoroughbred. I say that an ill-bred thoroughbred is the worst animal to breed from. "Like produces like," the world over.

Mr. Lucas says we must cut our hay before the 15th of July. I think he is perfectly right. I once advanced the opinion that a ton of hay cut before the 10th of July,—in other words, cut just in the right time,—was worth more than a ton of hay cut on the 25th of July, and people laughed at the idea. They said, "A ton of hay is a ton of hay; if it comes to maturity, there is more heart in it." There is so much heart in it, that the cattle won't eat it, or, if they do eat it, they won't grow. I have noticed that those farmers who are in the habit of cutting their hay earliest, and getting it in the best condition, are the farmers who have the fat cattle. It is an up-hill business, and pays poorly, at best, to feed cattle through our long, tedious winters of seven or eight months, and have them come out no better in the spring than they were in the fall.

Mr. Howard. I felt quite interested to hear my friend Burleigh state the fact he did in relation to thoroughbred animals. I have been aware for a long time that the words "herd-book animal" had lost their potency; that unless an animal possessed the properties requisite to recommend it for breeding purposes, the words "herd-book animal," as applied to it, had little or no force, whether we were breeding for labor, for beef, or for milk; that the properties for taking on flesh or producing milk must be in the animal, whether his name was in the herd-book or not. I conceive that to be one point gained that is of advantage to the agricultural community, and one that will aid in the improvement of stock,—not only the stock that we raise for labor and for beef, but for milk, and the other dairy purposes. I was pleased to hear such remarks from so intelligent a source. And I have been very much interested in the remarks of our friend Lucas, in relation to the improvements that are necessary to be made by farmers. To be sure, he took a wide range, but the improvements he suggested can all be carried out. All will admit that the crops which are produced in the older parts of the State are inferior to what they were forty years ago, and the question of improvement is one in which we are all interested. Our land, fifty or sixty years ago, when it was rich with vegetable mould, produced good crops, but we have continued to crop it until it has become exhausted, and we have been trying for years, by saving manure, by buying phosphates, and other chemical manures, to restore it to its former state of fertility, but our efforts have proved, to a great extent, futile. The demands of the soil have been, year after year,

greater than our supply, and we have been discouraged, to a certain degree, as we have realized our inability, with the means we possess, to restore the soil to that state of fertility that it possessed in its virgin state.

Now the question arises, what can we do? These are facts that stare us in the face. Our soil grows poorer year after year. Notwithstanding we use all the means we have to recuperate and enrich the soil, we fail every year; the demand of the soil is greater than we can supply. What shall we do? This is an important question. Mr. Lucas presented it in a great many phases, but what can we do? It is a discouraging state of things, when a man who has spent his whole life in improving his farm, as he thought, finds that six acres of pasturage are required to support a cow where two acres would formerly do it. And so it is with regard to hay. When the land was in a fertile condition, one acre would furnish hay enough to keep a cow. Now, how does it average? In the exhausted state of our soil, it requires nearer five acres. The income of eleven acres of land, I think, is not more than the average which is required to support a cow annually.

Now, in this exhausted state of our soil, what shall we do? I think we are rapidly approaching the time when it will be necessary to adopt the plan of soiling our cattle. It has been said by those who have soiled stock, that one quarter of an acre will produce corn fodder sufficient to keep a cow. I think we are rapidly approaching that condition of things when we shall be forced by necessity to adopt the practice of keeping our stock in the barn, and feeding them on green food, and the labor of years which we have spent in fencing our rough pasture lands will all have been in vain. Necessity will compel us to allow these pasture lands to go back to forest, and thus relieve ourselves of the enormous expense of fencing. We must turn our attention to soiling our cattle, and keep from one acre as much stock as we now do from ten.

Mr. CARR. I apprehend that brother Howard is partly right and partly wrong in his remarks about the herd-books. I think we need a herd-book for every kind of stock, because, if we did not have a herd-book, we should not know the pedigree of any live stock. We must certainly know that. The trouble is with brother Howard,—the trouble is with everybody,—that sufficient judgment is not exercised in the purchase of animals. We do not expect to find in the Jersey, the square, plump shape that we

do in the Shorthorn or the Hereford; therefore, if a person is about to buy any kind of stock, he must use judgment. You would not expect a man who was going to buy a full-blood Durham to get a creature peaked at both ends; he would buy a good, square creature. Just so with the Jersey; you would not expect him to get an animal shaped like a Durham.

I agree with what brother Lucas says about cutting hay early in the season. He says hay is too low. I should be glad to see hay higher; but in my estimation, twelve bushels of corn are worth as much as a ton of hay.

Mr. COLBURN. Have you ever tried the experiment thoroughly, so that you know to a certainty?

Mr. CARR. I have fed considerable grain. I have never had a pair of scales in the barn so that I could weight it, but I have to use my own eyes, as most farmers do. Hay to-day is worth from $16 to $20 a ton in this and the adjoining counties; so you see a man is better off to sell part of his hay and buy grain, because two tons of hay will buy enough grain to take the place of three tons of hay. There would be a saving of fifty per cent., as far as that goes.

Allusion has been made to the importance of having a tight, warm barn. Supposing a man has a common barn, just boarded—"open-work," as it is called—if he has not money enough to shingle or clapboard it, let him take one or two thousand shingles and four or five pounds of nails, and batten it on the inside, beginning at the top and shingling down, driving the last shingle down between the sill and the boards; that will keep all the water out. A thousand shingles will shingle a pretty good-sized barn in that way. And it would not be a bad idea to do that, even if you had clapboards or shingles enough to do it outside.

Yesterday, you remember, we had considerable talk about ventilation. In my opinion, every room that persons live or sleep in, should have windows to lower and hoist, both; it will cost but little. I have arranged my windows in that way, at a trifling expense, and now I can get a constant current of air, if I wish.

Then, again, I believe, as has been said here, that it is absolutely necessary for everybody to have the sun shine on them. I have the rooms in my house that we live in on the sunny side. Then in regard to bed-rooms. A great many people think almost anything will do for a bed-room, but I think it is important that a sleeping-room should have air and sunshine. Since I have lived

in Winthrop, I have had to sleep in a room with only one window, that was on the south side of the house. I have now put a window on the west side, and I think it is a good plan. Some people say, "all these things cost money." It is true they do cost money, but there are ten thousand ways in which we can better ourselves with very little expense.

The idea of planting fruit trees and vines has been alluded to during these meetings. I believe that the farmers of this State have paid out, for the last ten years, over $100,000 a year for foreign trees and shrubs. That money, in my estimation, has been almost entirely thrown away. I believe the people of this State would have been quite as well off if they had put the money into bags and sunk it to the bottom of the deepest pond they could find. My idea is, that we ought to raise our own trees and our own vines, every one of them. The idea of bringing trees, grape vines, and all those things, from the south, in my opinion, is wrong Carry your trees, if you must carry them, from the north to the south, not from the south to the north. It is true, some folks say we cannot raise them, but I say we can raise them. Let a man who wants to set out one or two acres go to work and plant his seed, and in ten years from now, his trees raised from seed, will be better than the New York trees he might buy for $35 a hundred, and set out next spring. I have had some little experience with New York trees, and probably have got some as handsome ones as ever you saw; but they are not good for anything.

Mr. COLBURN. I want to allude to feeding corn instead of hay. Ever since I have taken any notice of these things, I have observed that when people have made an estimate of the value of corn as compared with hay for feeding stock, they have called from ten to thirteen bushels of corn worth as much as a ton of hay. I have never carried the corn or meal into the barn and weighed out my hay, and tried it in that nice way, but I have experimented as carefully as I could in feeding, and I have thought that estimate was not correct; but I heard a good farmer make the statement to our Board last winter, that he had tried the experiment, and had his hay and grain carefully weighed and measured, and he had come to the conclusion that it took just twenty bushels of good corn to be equal to a ton of *good* hay; that is, dried grass,—what we always ought to have. I believe, from my experience, that that approximates as nearly to the truth as

we can get. I tell you, when you get a ton of good, early cut, sweet hay, that smells as sweet as grass, and does not choke you with dust when you handle it, there is a great deal more virtue in it than we are apt to give it credit for.

Mr. H. A. GILBERT. I want to ask Mr. Howard whether he thinks that our soil is growing so poor that we must emigrate to the Western States, or that we can, by judicious cultivation, bring it up to its old state of fertility? It so happened, that at the commencement of my farming operations, I went upon a farm where a good old man had felled the trees, brought up a large family, and spent his life, until he had reduced that soil to such a degree that the farm did not produce but five tons of hay the first year I was upon it. Now, this is the point I want to come at: whether or no it is a fact that these farms have been run down, all of them, or whether some of them have been coming up. I went over thirty acres of that farm, probably, to get those five tons of hay; the fences were all down; the buildings were all down, pretty much; but how is it to-day? Where I cut one ton of hay then, I cut seven, eight, or ten tons now. I believe that this soil is not exhausted. I believe that you may work it until you get twenty, thirty, or fifty feet below the surface and that soil is as good as the present.

Now, there is blame somewhere. It is not in the soil; it is not in the climate. We have got one of the best locations there is in the New England States, to say the least. It has so happened that I have travelled over the New England States, and it is my candid opinion, that I never saw in the New England States so good a soil as the soil on the Androscoggin and Penobscot rivers. I say the second, third and fourth generations are to blame. The first settlers here spent their lives in reducing this soil, and it is reduced. I know we are placed in such a situation now that we do not know how to move, but I think if we will use judgment and discretion, we can get out of it. I wish Mr. Howard to explain this matter, because if the soil has been depreciated irredeemably, I want to be off somewhere else.

Mr. HOWARD. The remarks that I made in relation to the question of our soils were brought to my mind by the lecture of Mr. Lucas, who well described the position of things in respect to the high prices of labor and the competition the West produces. I believe the fact will be generally admitted, that we have been exhausting our soil. At least, I so understand it. When the

forest was first cleared off, and for some years after that, very bountiful crops were raised, but finally it was seen that our crops were depreciating, and agricultural societies were organized for the purpose of devising means to replenish the exhausted condition of the soil. Manure was saved with more care, and the bog meadows and swamps were resorted to for material to mix with the manure and liquids around the barn, and these measures had a very good effect in many instances. Then we resorted to guano, phosphates, Bradley's No. 10 or 20, and the Cumberland manufacture, which was more especially resorted to here; but all our efforts have failed; the demand of the soil is greater than our supply. That is according to my observation. We are gradually exhausting the soil, and all our efforts fail to restore it to its original state.

Now, in this state of things, what is our remedy? I rejoice to hear that my friend Gilbert has renovated that old farm, but he did it at a time when labor cost less than it does now, and perhaps he was more successful in applying the means that he has at his command than the majority of farmers are at the present day. It does me good to know that there is one bright spot in the farming in the old part of the State of Maine. But, after all, that is only an individual instance; as a community, I think we are approaching a crisis, where a revolution,—a change in our management,—must soon take place. The high price of labor, the competition of Western products, and many other things, press us on to that necessity. We must change our methods; we must spread our labor and our capital over a smaller compass; cultivate what we do cultivate more thoroughly, and turn the rest back to forest. I do not know that I can give any further light to my friend Gilbert.

The Chairman. The question started by the first speaker following Mr. Lucas, in reference to well or ill-bred animals, is an important one. One of the speakers who followed seemed inclined to ignore the herd-books. I hardly think it will do for this Convention to ignore the herd-books that are being published.

Mr. Howard. I wish to correct the speaker. I did not mean to be understood so. I said that the words "herd-book animal" had in a measure lost their potency. I said an animal must have shape and everything else to recommend it, with the herd-book name.

The Chairman. I was going to say, that it might be well to ascertain the opinions of gentlemen in reference to what consti-

tutes a well-bred animal. It is an important subject to your Winthrop men. It is an important point to be considered by those of you who are breeding these Jerseys, upon which you pride yourselves so justly. Therefore I would call upon Mr. Percival, well known in your own county, for some remarks upon this question of well-bred animals, and also upon the question of feeding, if he sees fit to refer to it.

Mr. Percival. It is a broad question, this question of the breeding of animals. What do we mean by a well-bred animal, and what do we mean by a thoroughbred animal? The question has been asked me, "What do you mean by 'herd-book,' and 'pedigree,' and all that sort of thing?" Well, I do not know that I can define my position any better than to start right from first principles; and I tell you I believe that if we start in any thing—farming or anything else—we have got to start from first principles, and those principles have got to be correct, or we shall just as surely fail as the world.

Now, I want to preface a little. I am apt to take what comes last first. This matter of exhausting our farms comes first. When God made the world, he made it correctly, I have no doubt. Now, has anybody, or can anybody improve upon the works of the Creator? I say not. When God made this earth of ours, he made it, of course, right for our subsistence; he made it with all the elements necessary for our subsistence. What have we been doing all this time? Have we carried out the law of nature? Have we been giving old mother earth what we have been taking away? I say, in some instances, we have been reducing the soil; in other instances, we have been giving to the soil perhaps more than it contained formerly. There may be a mistake either way. You analyze a soil, and you find that it contains the elements to produce certain kinds of crops. To illustrate,—here you have a very fine grass farm, which will produce an abundant crop of hay every year. You take a crop of hay and analyze it, and see what elements it contains. If you sell that hay every year for a series of years, you are taking away from mother earth the chemical elements that produces grass, and giving nothing back. But if you restore the same elements that you take off, in phosphates or salts, or something else, no matter what, and keep that soil in just the same condition in which God gave it to you, I ask you why you cannot produce just as good hay this year as last year, and so on

for a series of years? The trouble is, we starve old mother earth, and she will starve us. That is my idea about reducing the soil.

The question is, how shall we give back to the earth the elements that we take off? One man says, "I will raise that crop and sell it." Another man says, "I will raise that crop and eat it." Now, how are you going to do it? I say, get thoroughbred animals of some kind. Now, what kind? You say Jerseys; I say, Shorthorns; somebody else says, Ayrshires; somebody else says, Herefords; somebody else says, Devons; and somebody else, something else. Every man wants the breed he likes, and if a man is satisfied, that is about all there is to it. You in Winthrop want Jerseys; I do not want them; I want Shorthorns, and you do not want them. A man comes to me and says, "Mr. Percival, have you got any Jerseys?" "No, sir; if you want Shorthorns I can sell you; if you want Jerseys, go somewhere else; but be sure you get the genuine article; be sure the first principles are correct. Be sure, in other words, that you get a herd-book animal."

Now you will ask me, "what is a herd-book animal?" I will tell you; a herd-book animal has a pedigree. What is a pedigree? you ask. Pedigree is nothing more nor less than the "Family Record" that you have in your Bibles. A man there traces himself right back to his ancestors. Was he bred in line? "What do you mean by breeding in line?" Were his father and grandfather, and so on back (for illustration) Wing's? Have you kept the line on the other side? "What do you mean by that?" I mean, have you kept in the Wing's on the other side; are you a Wing concern? In other words, have you descended down, from away back in past ages, from the family of Wing's? If so, you are a pedigree animal, brother Wing.

Now you will ask, undoubtedly, if he is a pedigree animal, if he is a thoroughbred animal, if he is a first-rate animal? I don't know about that. Let me see. In the first place, let me see the animal,—let me see (to illustrate) Mr. Wing, and look him over. He is all right; his general structure is all right; I can find no fault with the structure. Now let us see; was Mr. Wing's father all right? Look back and see whether he was. Was his grandfather all right? Was his great-grandfather all right—and so on? Now, let us look on the other side. Was Mr. Wing's mother all right? was she a good, nice woman? Had she constitutional

vigor? Is he all right on both sides? I guess he is. That is the animal for me. He has not only a good pedigree, but he is a good animal himself. You have got the first principles, properly illustrated; you have bred in line all the time; you know who his ancestors were,—they were all good, and the animal himself is all right.

Let us go back, and say we find that Mr. Wing's father died of consumption, and Mr. Wing's mother had the asthma, and so on through the whole catalogue of diseases. You find all the way through, diseases, and those diseases are hereditary; they are transmitted to the offspring. Hence, by-and-by, although the structure may be all right, Mr. Wing's child dies of consumption. What is the occasion of that? The first principles were not correct; the disease is hereditary; it was transmitted from the grandfather down. Hence every herd-book animal is not a proper animal to breed from. But by this pedigree,—this family record,—you trace it clear back, or you refer to it, and you trace it down. And I will here say, that a general knowledge is necessary. For instance, a man comes to me and says, "Mr. Percival, I want to buy a bull; you know what I want, and I don't." Well, I look over my herd, and say, "what have you got now?" "I have got a cow." "What is her size?" "So and so." "What was the name of her dam?" "So and so." I go and ascertain the pedigree of his animal, and then I say, "I have got a bull from the same strain of blood, that is just what you want to cross on your cow, because I know you are all right." It is not every ignoramus who can pick out of my herd the best animal. Hence I am amused when a man comes to me and says, "I want to see your stock." "Very well, what do you want to look at?" "Bulls." So I show him my bulls. "What do you want for those bulls?" "Well, it depends very much upon what animal you take." "Well, for the choice." "Three hundred dollars for the choice," more or less. Perhaps he will pick out just the animal I know he does not want. I give him his choice; he presumes to know more than I do, and does not ask me for any counsel in the matter. He buys the animals; he gets just what he wants, and perhaps curses me by-and-by because he has got an animal which does not breed well with him. I have told a man, "That is not the animal you want," but he has bought, in spite of me, the very animal I knew he did not want, and taken him home, and breed with him, and the result has been a failure. If a man comes to me and says,

"Mr. Percival, I want you pick me out a bull," I pick out one that I think is a good one. But if a man prefers his own judgment to mine, and selects an animal that he ought not to have, I do not force my advice upon him. You see, therefore, that a general knowledge of the animal organism and a general knowledge of pedigree is necessary.

Now, men come up and say, "Mr. Percival, your pedigree is all bosh. I do not believe a word of it. You fellows talk smooth, and will make a man believe the moon is made of green cheese, but it amounts to nothing. Grade animals are just as good as thoroughbreds." Let us see. I have told you what the result of breeding in line will be. But breed from grades, and where are you? Let a man come to you and buy the best Jersey bull you have got; you know he is all right; he has a good pedigree, and is just as good an animal as can be. He takes that Jersey bull home, and breeds it on the meanest native cow that can be found in Christendon. Well, what does he get? He gets a grade, of course. The first year, it is a half-blood Jersey. Well, he grows it up, and the next year breeds on the same cow. What does he get the next year? He gets a pure native, of course. There is no uniformity.

Now let us go back and take a grade animal, and breed it to a thoroughbred, and see what we get. The grade is made up of Ayrshires, Herefords, Shorthorns, Jerseys, and everything else you can think of. Well, you breed a thoroughbred bull on this grade cow. What is the first calf? it is a grade Jersey. What is the next calf? it is a grade Shorthorn. What is the next calf? it is a grade Kerry. What is the next calf? it is a grade Devon. What is the next calf? it is a grade Holstein,—and so on through the whole catalogue, the dam being a mixture of everything. Now, where is your uniformity? You are just as likely to breed the one as the other, and you have got in the same family, Jerseys, Herefords, Kerrys, Shorthorns, and everything else you can think of. Is that desirable? You say no. And so it goes on through the whole catalogue of the different grades. I ask you if that is not so?

Now, to come back again to this point of thoroughbred animals, I want to illustrate from your own people. Your pedigree is good, as I said before, but your children, from wrong treatment, from dissipation and vice, degenerate, become diseased, and by-and-by go away, and you are ashamed to own that they belong to the

Wings. Why? Not because there is not good Wing blood in them, not because you have not done your duty, perhaps, but because it has degenerated by reason of dissipation and vice, and all that sort of thing. Now, I ask you, if you get a first-rate animal, just as good as it can be, and starve it or freeze it half to death, if you may not destroy the very germ of perfection in that animal? And when you come to grow it up, you have not got anything that is desirable,—you have not got anything to recommend it.

Now, if humanity will thus degenerate, why should not these dumb beasts? Hence, are not many of the charges that are brought against herd-book animals and against breeders of animals, false, and the disappointments complained of, the result rather of the treatment of the animals after they have been purchased, than of any fault on the part of the breeders? So you see I am in favor of herd-book animals; and yet, I never buy a herd-book animal without seeing the animal myself, or knowing that the man with whom I am dealing is a perfectly responsible man, who will not tell me that an animal is first-rate unless it really is so. I have frequently ordered bulls without seeing them, as you have no doubt frequently had orders for Jersey cows and bulls, (for I presume I am talking to Jersey breeders) without the purchaser seeing them before they were sent to him; but he knew you were responsible men. You send him the pedigree of the animal, and his knowledge of the amimal organism, his knowledge of the herd-book, and his knowledge of you as responsible men, is a sufficient guarantee for him, and he orders the animal. So that I will say to you, so far as breeding is concerned, purchase nothing but thoroughbred animals, either Jerseys or anything else; then get the proper structure from responsible parties, and if you do not get uniformity in breeding, if you do not get just what you bargain for, every time, I will pay the bills.

You will ask one other question, I have no doubt: Can you breed dairy qualities and beef qualities in the same animal? I say you cannot; some say you can. I am going to argue my side; the man who says you can must argue his. How are you going to do that? If I wanted to start, I should go to Mr. Gilbert or some other man, who has made it a point to breed in the direction I want. I bought a Jersey cow about a year ago, that was a splendid looking animal. I looked her all over, and

says I, "You look so like a Shorthorn, I will buy you, and if you are as good as you look, if you will give milk as Jersey men say their cows will, I should like to put you into my herd." In short, she was as fine a looking Jersey cow as I ever saw. People told me she was not a pure blood Jersey, because she looked so well. That is not much of a compliment to you Jersey men, I own. I bought her because she had a good pedigree. But the fact is, as a gentleman told me, "She is a splendid looking cow, but she won't give milk." What your cows put into milk she puts into fat, in part. You cannot have your cake and eat it too. You cannot have milk and fat at the same time. I want a cow that while you are milking her, will put what you put into her into milk, but has got constitutional vigor enough, when you stop milking her, to put it into fat, so as to make beef. I will say, that every lawyer or ignoramus in Kennebec, or any other county, cannot do that thing. A man cannot in my judgment, start right out of a lawyer's office, never having been interested in farming, or raised any animals, and go right to work and do it the first time. A man must have some knowledge of this thing, he must have some general practical common sense about it, and then go to work and make his selection upon first principles. Look at a good heifer—you can almost see the milk running out of her; and at the same time, you will see a good broad chest, and every indication of a vigorous constitution. You will see that she has not only the milking organs that want to be and can be developed, but that she has got other organs which, by proper food and treatment, can be developed. You must have knowledge to know how to select such an animal. Then you will say, "She has got these organs, I am going to develop them." How will you begin? Select a bull from the same strain. Her constitutional vigor is the same, her general structure is the same, and she will breed well to that bull. That bull must inherit the same qualities, and you breed them together. When that cow comes to have a calf, you want to feed her before and after calving, to develop and distend the milk organs. Give her good, nutritious food, and food that will make milk, bone, muscle and fat, at the same time. If she is inclined to put it into milk, she will do so while she is giving milk. Now, you drain her down, I do not care if you milk her pretty poor with her first calf, her constitutional vigor will not be impaired the first year, if she is the right kind of a cow.

Then you dry her off. I should give her a little time to recuperate, and after you have developed those organs, I would not recommend you to milk that cow up to the time of calving every time. Her milk-secreting organs are developed. You have formed habits in that cow, just as you may with boys or girls. You may feed a boy or a girl and keep them stuffed all the time, their organs distended, and they will be gluttons all their days. We are only brutes of a higher order. Therefore, develop these points in the young animal, and when they are once developed, I do not care if you dry her off after a while. What is a little milk or a little butter compared with a Jersey calf that is worth a hundred dollars? I do not believe you can produce milk and beef at the same time. Why not? Because I have got a cow that is giving milk all the time, and she is just as poor as a crow. Why shouldn't she be as poor as a crow? Can you expect a woman to bear a child every year and retain the robust constitution which God gave her, or which she had when you found her? No. How, then, can you expect a poor dumb beast to yield a calf every year and give you milk eleven months out of twelve, feeding upon swale and meadow hay? Shall you expect of your cow what you cannot expect of your wife? So I say if you want a cow to fat up and be fit for beef, do not milk her twelve months out of the year, and at the same time expect her to raise you a calf every year, that you can sell for $250. You cannot fail to see that this is a very broad question; but I have trespassed too long upon your time.

Mr. PERCIVAL then resumed the Chair, and on motion of Mr. Z. A. GILBERT, the meeting adjourned *sine die*.

Impressed with the belief that our agricultural reports, while giving authoritative information on all subjects pertaining to agriculture from sources not easily accessible to farmers generally, should at the same time embody information relating directly to our own agricultural resources and capabilities, thus making them distinctive in character and of more direct value to our people—I have secured for this volume a report on the agriculture and industry of Waldo county, prepared by the member of the Board from that county. Although not taking so high rank as an agricultural district as some other sections of Maine, yet it possesses a large area of good land and has a large number of good farmers whose practices have been well delineated in the accompanying report. The writer also points out many defects in farm management which it is hoped may be avoided in the future. In order to give a full and satisfactory idea of the industries and capabilities of the county, it has been found necessary to go over some subjects that have heretofore received careful attention at other hands, but in a work giving a complete survey of the county this could hardly be avoided. The whole report forms a valuable contribution to our agricultural literature.

SURVEY OF WALDO COUNTY.

HISTORICAL, PHYSICAL AND AGRICULTURAL.

BY J. W. LANG,

MEMBER OF THE BOARD OF AGRICULTURE.

PREFACE.

It is with some diffidence I present this work to the public; but trusting to their generosity to overlook its imperfections, and desiring to contribute to the agricultural literature of the State a better knowledge of my county, has led me to undertake this survey. In pursuing the labor and investigation necessary, I have been kindly aided by many citizens of the county, whose names I treasure in memory, but withhold here, and to whom my thanks are due. I am indebted to the Reports on the Geology of Maine, by Dr. C. T. Jackson, Dr. Ezekiel Holmes, and Prof. C. H. Hitchcock; also to data and statistics contained in Maine Register and Year-Book, U. S. Census Reports, Wells' Water-Power of Maine, and other works. I have given considerable space to descriptions of farms, accounts of the leading farmers and farm practices in various towns, as better illustrative of our farming than I otherwise should be able to do. I have endeavored to be practical, and think every page contains something of utility to the husbandman and mechanic.

SURVEY OF WALDO COUNTY.

PART FIRST.

Historical Sketch.

"A high country full of great woods," is the quaint description Martin Pring gave to the islands and shores of Penobscot Bay in 1603. He found good anchorage among these islands, and the best of fishing. Upon one of the islands they saw some foxes, and they gave the name "fox islands" to the whole group; which name they bear to this day. The cod and haddock they found abundant and esteemed them better than those taken at Newfoundland. They were particularly pleased "with the very goodly groves seen, and the sundry beasts they saw." Pring carried back with him, to Bristol, England, the port from whence he sailed, an Indian canoe, as a specimen of the aborigines' skill and ingenuity. Not many Indians were seen; they were probably—as this was in the summer season—in the interior hunting.

The aborigines of the Penobscot were the *Tarratines*, claiming dominion over the contiguous territory from its sources to the sea. Smith called what is now the Camden Heights, the "Penobscot mountains," and says that "they were the natural barriers and fortresses which separated them from their neighbors on the southwest." The Tarratines were one of the three tribes of the Etechemins, and were a numerous and warlike tribe. The other two tribes of Etechemins were Openangos (Quoddy Indians) and the Marachites, who inhabited what is now part of New Brunswick and Nova Scotia. The Tarratines, (Penobscots) were more hardy and brave than their western neighbors, whom they often plundered and killed. They were less troubled by disease, or wasted in their possessions by the whites, and were more reluctant to make war with the English than the other tribes of Maine. They were early supplied with fire-arms by the French, and found trade and traffic were more profitable and pleasant than war.

Baron De Castine appeared among the Indians in 1667, and built a fort and trading post at Pentagoet, Penobscot, Major

Biguyduce, or what is now Castine. Here the English had a trading post as early as 1626, which the French plundered in 1632. About 1636, De Aulney, under authority of the French king, built a fort here, and firmly established himself, where he remained till his death in 1650. Castine rebuilt De Aulney's fort and buildings which had fallen into decay, and remained many years. The Indians became firmly attached to the French. "They lived with them as one family, inter-married, and made the English their common enemy." The French supplied them with powder and guns, and taught them their uses, and bought their furs. They made no effort to enlarge their settlements, while the English were pushing theirs with great vigor, which excited hatred in the breasts of the natives.

The principal villages of the Tarratines were upon the Penobscot river near where Bangor now stands, and above. The Tarratines were neutral in the war of the Revolution, and for this Massachusetts protected them and took their lands only by fair, honorable purchase. Maine latterly has granted them annual aid and assistance. A remnant of the tribe once numerous and powerful, few and fast fading, yet exists at Oldtown. Once they roamed these forests and hunted their game where fields now bear their annual harvest. These sons of the wildwood, stalwart and brave, this broad land their heritage, now dwindled to a weak, remnant band of hardly more than a score, owning but a small island amid the river which bears their name. The white man—the son of progression—has proved his superiority, and behold the wondrous change! Cities, villages, pleasant farms and homesteads, teeming with abundant products; mills busy with industrious hum, variegate the landscape White winged vessels dot the bay and river; the steamer plows grandly through its waves; the iron horse with rush and roar drags swiftly on its freight. All this meets the eye and delights the heart where once was but a "high country full of great woods and divers beasts seen." And all this accomplished in so brief a space compared with the history of European nations—a span in contrast. And the past is but a finger post on the road to future possibilities, to future attainments and greatness.

Weymouth discovered Penobscot bay and river in June, 1605. Leaving Pentacost harbor (George's Islands) on the 11th of June, he sailed northward by estimation, sixty miles. They came to anchor abreast the Penobscot Hills, (Camden Heights,) not far

from land and ten of them went on shore to hunt. "The next day," says the record, "We went in our pinnance to that part of the river which inclines more to the westward." [Probably Belfast Bay.] They were highly delighted with the views obtained at this season of the year, with this to them, novel scenery. The woods coming down to the water's edge, dark, green, and luxuriant; the silent stretches of placid water, calm as the forest lake, the blue summer sky of June overhead, the songs of many unknown birds amid the branches, the waters teeming with fish, glassy and resplendant, wide and deep, it is no wonder they put on record: "Many who had been travellers in sundry countries, and in most famous rivers of ye wourlde, affirmed them not comparable with this—the most beautiful, rich, large, secure harbouring river in ye wourlde affordeth." Such were the quaint sentiments and enthusiastic expressions excited by this discovery, and we do not wonder they took their departure reluctantly for St. Georges.

Weymouth's intercourse with the natives was, at first, very friendly; but differences arose, and he has left an indelible blot upon his fair fame by kidnapping five of them which he carried with him to England, three of which he delivered to Sir Ferdinando Gorges, Governor of Plymouth, who kept them in his family three years. This circumstance enlisted his sympathies strongly in the project to colonize the country of these Indians with English.

In 1639 the PROVINCE OF MAINE was chartered to Sir Ferdinando Gorges. In 1652 the County of York was established, and embraced all the present State, or rather what was then settled with jurisdiction over the rest when settled. Massachusetts claimed the whole Province in 1672, and in 1677 purchased the interest of Gorges' heirs. In 1675 the Dutch captured the French garrison at Castine, and were in turn captured by the English. In 1696, Major Church made his third eastern expedition, and ascended the Penobscot.

Thus previous to 1700, we find Penobscot Bay and vicinity had been visited by many, and was regarded as an important section. Among those mentioned, Pring visited it in 1603, De Monts in 1605, Weymouth in 1605, Capt. John Smith in 1614, De Aulney in 1636 to 1650, Castine in 1667 to 1675, Major Church, 1696.

We come now to the era of settlements, and our notice of these must be brief for want of space. We shall attempt to give but a mere outline and regret we are unable to give more extended historical notices for the reason mentioned.

Stockton—First settled in 1750 at Fort Point. The garrison was maintained here till the settlements no longer needed its protection. Fort demolished during the Revolution. Incorporated March 13, 1857—formerly part of Prospect. Population, 2,089; valuation, $800,220.

Prospect—Named for its beautiful views. Incorporated Feb. 24th, 1794. Taken from Hancock and annexed to Waldo in 1827. Comprised Searsport and Stockton. Population, 886; valuation, $184,492.

Islesboro'—Formerly called Long Island. Settlement began by William and Benjamin Thomas in 1769. It was incorporated Jan. 28th, 1789. It is ten miles long, and contains an area of 6,000 acres. Population, 1,232; valuation, $153,702. Its inhabitants are largely engaged in maritime pursuits. It was formerly largely engaged in fisheries.

Belfast—Settled in 1770 by people from Londonderry, N. H., who named it in honor of their native town in Ireland. Incorporated June 22d, 1773. The British broke up the settlement in 1779, when they occupied Castine. Settlement reëstablished in 1786. Invested by the British again in 1815. Parted with territory to half form Searsport, in 1845. Made a city in 1853. Population, 5,278; valuation, $2,660,879.

Frankfort—Settled 1770 and was incorporated June 25th, 1789, embracing what is now Hampden, Prospect, Winterport and parts of Stockton, Searsport, and Belfast. It was 70th town incorporated. Population, 1,152; valuation, $220,645.

Montville—Settled in 1780 and incorporated the 163d town, Feb. 18th, 1807. It was originally called Davistown. Contains 20,200 acres. Population, 1,468; valuation, $389,845.

Northport—Settled 1780, and incorporated February 13th, 1796; a seaboard town. Population, 902; valuation, $180,726.

Unity—Settled 1792, and incorporated June 22d, 1804. Situated in a pleasant farming section. Population, 1,201; valuation, $384,465.

Freedom—Settled in 1794 and incorporated Feb. 11th, 1813, the 197th town. First settled by Messrs. Smith, and called Smithtown; the name was afterward changed to Beaver Hill, then to Freedom. Population, 717; valuation, $191,505.

Brooks—First settled in 1798 by Joseph Roberts. Incorporated the 219th town, Dec. 10th, 1816. Plantation name was Washington. Population, 869; valuation, $200,176. Named for Gov. Brooks of Massachusetts.

Jackson—Settled 1798 and incorporated 229th town, June 12th, 1818. Named for President Jackson. Population, 707; valuation $176,604.

Knox—Named for General Knox. Settled, 1800. Incorporated 231st town, Feb. 12, 1819. Population, 890; valuation, $218,392.

Monroe—Organized under name of Lee Plantation. First settled in 1800. Incorporated Feb. 12th, 1818. Named in honor of President Monroe. Is a good farming town. Population, 1,375; valuation, $326,835.

Belmont—Settled 1800. Was part of the Waldo patent, and part of Green Plantation. Incorporated 202d town, Feb. 5, 1814. Divided in 1855, and north part incorporated under name of Morrill. Population, 629; valuation, $101,708.

Burnham—Incorporated February 24, 1824. Plantation name Twenty-Five-Mile Plantation. On Maine Central and Belfast Branch railroads. Population, 891; valuation, $175,007.

Lincolnville—Incorporated 137th town, June 23d, 1802. Formed from Plantations of Ducktrap and Canaan. Is the most southerly town in the county and upon the shore. Population, 1,900; valuation, $436,956.

Liberty—Incorporated January 31st, 1827. Has a fine water-power. Population, 907; valuation, $193,819.

Palermo—Originally known as Sheepscott, Great Pond Plantation. Incorporated 157th town, June 23d, 1804. Population, 1,224; valuation, $241,433.

Searsmont—Settled 1804, and was a part of Waldo Patent which fell into the hands of Sears, Thorndike and Prescott. Incorporated and named for the first of the above named proprietors, Feb. 5th, 1814. Population, 1,418; valuation, $300,418.

Swanville—Formerly the Plantation called Swan. Incorporated 228th town, February 19th, 1818. Population, 770; valuation, $140,050. Has good water-power.

Thorndike—Named for one of the proprietors, who gave it $500 for a school fund. Originally called Lincoln Plantation.

Incorporated February 15th, 1819. Population, 730; valuation, $264,801. One of our best farming towns.

Troy—The most northerly town in the county. Plantation name Bridgton, and named in honor of Gen. Bridge. Incorporated Feb. 22d, 1812, under name of Kingville. Name since changed to Jay—Montgomery—and Troy. Population, 1,201; valuation, $233,361.

Waldo—Named for Gen. Waldo. Organized a plantation in July, 1821. Enlarged by addition of territory set off from Swanville, in 1824; also by addition of a gore lying between Waldo and Knox, in 1836. Incorporated March 17th, 1845. Population, 648; valuation, $144,218.

Morrill—Set off from Belmont, March 3d, 1855. Named in honor of Governor A. P. Morrill. Population, 523; valuation, $133,099. Has good water-power.

Searsport—Set off from Prospect and Belfast, and incorporated Feb. 13th, 1845. Named in honor of David Sears of Boston, then owner of Brigadier's or Sears' Island. One of our enterprising shore towns, which with Stockton, is largely interested in ship-building. Population, 2,889; valuation, $1,036,823.

Winterport—Set off from Frankfort and incorporated March 12, 1860. Has an open winter port, hence its name. Is the port of Bangor, winters. Is also a fine farming town. Population, 2,744; valuation, $600,300.

Troy and Burnham are the two most northern towns; Prospect the most eastern; Lincolnville the most southern, and Palermo the most western. Thorndike, Unity, Montville, Monroe and Winterport the best farming towns; Brooks is the central town; Knox the most elevated town; Belfast the shire town; Islesboro' is an island.

Waldo county is square in form, with irregular outline. Its extent of shore line gives it great maritime facilities and the proximity of the sea has a visible effect upon its climate. It has valuable quarries of granite and lime, and soon in its north-western corner, slate quarries will be opened. Its lumber is of but secondary value now. Manufacturing is being introduced, and it has much fine water-power capable of being developed. The nearness to tide-water has kept agriculture in the background till recently, in many towns.

GEOGRAPHICAL FEATURES OF THE COUNTY—STATISTICS, &C.

Waldo county was embraced in York county's territory till 1760, when Lincoln county was established, which included it till 1789, when Hancock county was established; this in turn included it till 1827, when it was incorporated as a county. In 1860 it parted with some of its territory to help form Knox county. It embraces twenty-five towns and one city. It was named for Gen. Samuel Waldo. Valuation in 1870, of estates, $10,090,581; population, 34.640.

Waldo county lies upon the waters of Penobscot bay and river, which bound it upon the east and south-east. Knox county lies upon the southern border, and Kennebec upon the western; Somerset upon the north-west and Penobscot upon the north. The Belfast and Moosehead Lake Railroad beginning at Belfast and connecting with the Maine Central at Burnham, runs north-westerly across the county, opening up a fine farming country upon its upper course. This railroad is 33⅓ miles long, and is the only railroad the county boasts at present. Lines of steamers connect Belfast with Bangor, Boston, Portland, Rockland and other ports.

An open winter harbor anywhere on the extended coast line, numerous land-locked secure havens with good depth of water, offer facilities for shipbuilding and shipping unsurpassed. It also affords great facilities for obtaining marine fertilizers at cheap rates. Of these we shall speak of further under the head of manures.

There are no mountains, strictly speaking, in Waldo county, though there are eminences that are dignified by the title. The surface is rugged and broken in many places, while in others the reverse with pleasant hills and dales. There is no town that has not some waste land in it, and also that has not considerable good land. The breadth of tillable land increases as we recede from the shore line. In Prospect and Frankfort are high bald hills, with characteristic scenery. In Monroe we find a continuation of these, ranging to the north-west and extending through Jackson. These high, rounded hills, overlook the surrounding country, except to the northward, where the Dixmont hills in Penobscot county, raise their massy barriers to shut out the view in this direction.

The waters from the county flow in three general directions, forming as many water-sheds. The eastern part of the county drains its

waters into Penobscot bay and river. The south-western portion into the Atlantic ocean by way of George's river; the north-western portion into the Kennebec, by way of the Sebasticook river. The water-divide, or height of land, finds a central point at Aborn Hill in the center of the town of Knox. This hill forms the highest land in the county. The height of land extends northward through Thorndike and Jackson into Penobscot county; west, through Freedom into Kennebec county; south-west, through Montville and Belmont into Knox and Lincoln counties; south, through Waldo, Morrill, Belmont and Lincolnville into Knox county; east, through Brooks, Monroe and Winterport to Penobscot river; thus forming five water-sheds. The eastern shed is drained by Marsh river and its tributaries, which receive the waters of Brooks, Jackson, Monroe, Winterport and Frankfort. General course north of east. The south-east shed is drained by Goose river, rising in Goose pond, Swanville; Passagassawaukeag river rising in a pond of same name in South Brooks, and Quantabacook river rising in a pond of same name in Belmont and Searsmont. The southern shed is drained by the streams forming by their union, George's river. This has its source in several large ponds in Liberty, Searsmont and Montville; it is also drained by Duck river. The south-west shed is drained by the head-waters of Sheepscot river from Montville and Palermo. Several large ponds are in this part of the county. The north-west shed is drained by Half Moon stream which receives the waters of North Knox, Thorndike, Troy and Unity. In Unity a large pond contributes to its volume.

Waldo county embraces 388,794 acres of land, of which 228,842 are improved, 122,874 woodland, and 37,078 are other unimproved lands. The ratio of improved to unimproved is about 23 to 16. But a small portion of the lands reckoned under the head of "improved" are in a high state of cultivation. Low farming with mixed husbandry prevails. In 1870 Waldo county produced:

Hay	81,417 tons.	Butter	876,494 lbs.
Potatoes	680,971 bush.	Cheese	31,386 "
Wheat	17,241 "	Wine	368 gals.
Corn	40,594 "	Tobacco	1,000 lbs.
Oats	146,738 "	Clover seed	80 bush.
Barley	78,791 "	Timothy	168 "
Buckwheat	2,041 "	Hops	3,289 lbs.
Rye	1,085 "	Flax	100 "

Peas and Beans...	19,375 bush.	Maple sugar.....	3,059 lbs.
Wool.....	126,724 lbs.	Maple syrup.....	1,000 gals.
Honey.....	11,863 "	Wax.....	414 lbs.

Waldo county had live stock in 1870, as follows:

Working oxen.....	3,913	Other cattle.....	10,598
Horses	5,116	Mules.....	8
Cows.....	8,861	Value of all live stock	
Sheep.....	31,343		$1,690,662
Swine.....	3,064		

Value of orchard products.....		$55,449
" forest "		138,995
" animals slaughtered		339,077
" farms		7,058,828
" home manufactures.....		69,658
" market garden produce.....		25,079

Geological Notes.

In the two scientific surveys—or parts of surveys Maine has treated herself so grudgingly to—Waldo county has not come in for that share of attention she deserves. Those scientists who conducted the surveys were content, or obliged for want of opportunity, to cast about her borders a little, and leave the interior a sealed book. Dr. Jackson examined Waldo county along the shore line and upon her south-western border. He thus speaks of the geology of Penobscot river shore: "The shores below Hampden are composed of rough, craggy slate rocks, overhanging the river, alternating with rounded hills composed of sand and various pebbles, which have evidently been transported and deposited in their present localities by diluvial current.

"Approaching Frankfort we come first to regular strata of gneiss, and then to that variety of stratified granite, called granite gneiss.

"The strata run north-east and south-west, and dip 60° north-west. This rock has been wrought to some extent for building stone. It contains black mica arranged in parallel laminæ. Here and there we observed small veins of coarse granite intruded into its mass. Proceeding down river, we next came to coarse granite on which the granite-gneiss rests. At Marsh Bay, this rock forms hills 200 feet above the river.

"We stopped at Marsh river, 15 miles below Bangor, for the purpose of examining the granite mountains near that place. Mr. Pierce and Mr. Kelley joined our party on our excursion to Mt. Waldo, the height of which we proposed to determine by barometrical measurement. The next morning we made the necessary preparations for this purpose. I reached the summit of the mountain at 10 A. M. and found the height to be 964 feet above the river.

"This mountain is a commanding eminence, seen distinctly from Bangor, and for the distance of twenty miles around. It is a huge dome shaped mass of naked rock, which was formerly covered with an abundant growth of small juniper and other forest trees, which have been destroyed by fire. Now a few low birch trees grow here and there on those spots where any soil remains, and on some places there are abundance of blueberry bushes, which struggle for existence in the scanty soil. From the summit of this mountain, we enjoy a magnificent view of the surrounding country. On the north, the beautiful Penobscot river is seen wending its way to Bangor, and coursing by to the sea on the south-east.

"The mountain is composed entirely of a peculiar porphyritic granite, consisting of large crystals of pure white feldspar, block mica, and a little quartz. The average size of the crystals of feldspar, is about one-half of an inch in width, and of variable length, and they are so disposed as to give the rock a porphyritic appearance. The granite is remarkably pure, free from foreign matters, and will resist well the action of the weather. Blocks of any size desired, may easily be obtained, and I observed, that for 200 yards square, that there was not a single crack or fault in its mass. It splits into sheets or huge blocks, when quarried, and will doubtless be wrought for architectural purposes. When hammered, it does not show its porphyritic structure, but is very uniform in color.

"The Pharaohs of Egypt would have have gloried in a mountain like this, for after removing sufficient granite to build a city, the nucleus, if left in a pyramidal form, would be more than twice the magnitude of the Great Pyramid of Egypt, and this mountain has the advantage of being founded upon an immovable basis.

"After having examined Mt. Waldo, we ascended Mosquito mountain, and measured its height. * * * We find the height of Mosquito mountain to be 527 feet above high water mark.

"The mountain is composed of porphyritic granite, entirely, which is quarried extensively for building stones. The rock is certainly a very handsome building material and withstands the action of the weather without changing its color. It is, like the Mt. Waldo stone, composed of feldspar in large proportion, having porphyritic structure. Its mica is black, and the quartz is in small quantity. I could not discover any pyrites, or other material that would cause it to decompose. On examining the weathered surface of the rocks in place, we observed that the mica was the first ingredient that underwent decomposition. When the feldspar decomposes it becomes of a dull earthy white color, and loses its brilliancy, but does not become brown.

"From the workmen at the quarry, I learned that the first operations upon this stone began in the month of May, 1836, since which time, (1838) more than $50,000 worth of granite had been quarried and hammered for the New York market. The Albany Exchange is being constructed of this stone. I measured several blocks, as they were hammered for this building, and found them to average from ten to fifteen feet in length by three feet in width, and one foot in thickness, containing about forty-five cubic feet to each stone. There were a large number of blocks wrought in a beautiful manner, and ready for the market. On examining the loose blocks on the side of the hill, it appeared that many could be obtained upwards of forty feet in length, and free from seams.

"This rock splits perfectly well in the directions required, and is easily wrought. It has a light color when hammered, and will look well in any kind of architecture. I was informed, that no less than $20,000 had been expended by this company, in excavating a canal to the base of the mountain. This canal will enable the proprietors to ship the granite more readily.

"Nearly opposite Bucksport, (in Prospect,) the mica slate is seen cropping out at the river side. The strata runs north-east and south-west, and dip 75° south-east. This rock splits into regular sheets, and will answer for flag-stones, pavements, fences, &c. At Fort Point the argillaceous slate again shows itself, and is highly charged with pyrites, so that the surface is rendered brown by the abundance of per-oxide of iron deposited upon it. The pyrites mixed with the slate cause it to decompose, and sulphate of alumina and sulphate of iron are formed. It is not yet certain whether this rock can be advantageously wrought for alum, but

it certainly works as well as that now undergoing trial on Jewell's Island in Casco bay.

"The rocks of Belfast, consist of various slates, composed of argillaceous and talcose matter, with veins of quartz and laminæ of plumbago or graphite interspersed. In Prospect we observed extensive beds of tertiary clay. The upper beds are yellow and contain remains of siphonæ—while the lower are composed of blue clay, containing many marine shells. The clay is extensively used for the manufacture of bricks. Diluvial sand occurs near the brick-yards, and is used in their manufacture.

"Diluvial blocks of granite occur between Belfast and Frankfort, and were evidently derived from Mt. Waldo and its immediate vicinity. It will be observed that the slates on the Penobscot are highly inclined, and rests, as it were, on their edges, the ends of which are frequently exposed along the river course. Mt. Waldo, Mosquito mountains and Mt. Heagan, are masses of granite which were probably elevated after the deposition of the slate through which the granite forced its way, producing such chemical changes in the strata that rested upon it, as to render them crystalline in structure. Thus we supposed that the mica slate resting on both sides of Mt. Waldo, was formed from sedimentary matter, which was originally in a state resembling—but which, by action of heat, has become, crystalline.

"The hill in Belfast attains an elevation of 178 feet above the sea level. Northport mountain is 486 feet above the sea. This mountain is composed of gneiss, and on its side granite appears protruding through the strata of the rock. The gneiss graduates away on either side in plumbaginous and argillaceous slates. From the summit of this mountain we have a charming view of Penobscot bay, studded with beautiful islands, and skirted on the north and south by picturesque highlands. On its western side are seen some very well characterized diluvial furrows, cut into the slate, which ran directly across its curved strata, showing that the grooves were produced by mechanical violence, and are not the results of disintegration of the rock."

Dr. Jackson is of the opinion that the soils between the Penobscot and Kennebec need liming. This is given as a general rule, and he speaks particularly of this liming as necessary as regards the northern portion of the county.

Pyritiferous slate occurs in Troy, with beds of pyrites which furnish an abundance of copperas and alum. Dr. Jackson says:

"I have rarely seen localities which offered so good material as is found here, the pyrites being so perfectly mixed with the slate, that it will readily undergo chemical changes, when heated and moistened with water in the usual manner. Many absurd speculations have been entertained respecting the nature and value of this locality, some maintaining that the pyrites were gold or silver, and others that the plumbageous covering on the slate, was sure indication of coal."

Belfast, according to Dr. Jackson is 44° 26′ 7″ north. Variation of compass 13° west. He further says: "This town presents but few geological peculiarities, which have not already been described. It is founded upon that variety of argillaceous slate which is impregnated with plumbago, and hence is called plumbageous slate. The strata of this rock have been remarkably disturbed by the upheaving forces which acted during the period of the eruption of the granite. The rock forms by decomposition a blue soil, full of small scales or particles of the rock. But the soil resting on its surface, is all of foreign origin, it being diluvial deposition, and having been swept to its present resting place from the north."

In Liberty is an extensive deposit of granite quartz. Dr. Jackson visited this locality and thus speaks of it: "The granular quartz I found to exist in beds included between strata of mica slate, running north-east and south-west and dipping to the south-east. The widest bed measured eleven feet and it is exposed to view for the distance of thirty-one feet, and can be drained easily to the depth of thirty feet. Besides this there are numerous smaller beds, which it is more difficult to measure as they are quite irregular. Half a mile north-west we come to several other similar beds and veins, one of which is from two to three feet wide and extends fifteen rods in length. It can be drained to the depth of twenty feet easily; from measurements of those beds that are uncovered of soil, it appears that there are about three thousand tons of granular quartz that may be seen. Besides this the great beds evidently run under, and are concealed by the soil, and extend to a much greater distance than we were able to explore. I have no doubt that an ample supply of quartz may be obtained to supply a glass furnace, and that it may be converted into beautiful glass by the usual operations. It is much purer than any sand that can be obtained, being free from oxide of iron, and vegetable matter. When burned in the fire and thrown into water, it

becomes friable, and is more easily crushed than loaf sugar, so that it may be pulverized by an ordinary crushing wheel of iron, turned like those used by tanners in the bark mill, by horse or water-power." Wood is worth less here than on the seaboard, and transportation to tide water is cheap. Belfast is eighteen and Waldoboro' fifteen miles from this deposit. Dr. Jackson recommends the erection of glass works here, and says that the finest grades can be made, and in quality surpassed by none in the world.

Iron ore occurs in several localities. In the town of Liberty there is a deposit of black, resinous heavy ore yielding $41\frac{25}{100}$ per cent. of iron.

The principal deposit of gneiss in Maine is along the shore from Portland eastwardly across Penobscot bay. The southern part of Waldo county has large deposits of this rock. Mica-schist occupies a large area through the whole of the county, occuring in the greatest abundance in the central and northern portions of the county. On Penobscot river alternating with granite and gneiss are deposits of clay slate. In Troy, Palermo, Montville, Liberty, Brooks, Jackson and Searsmont, mica-schists predominate. A belt of rocks of indistinct talcose of micaceous character are found at Belfast, on the north side of the gneiss at Lincolnville and Northport. Andalusite is common in them. Limestone occurs at Lincolnville, Islesboro', where large quantities of quick-lime is manufactured annually. This limestone is azoic in character. Other minor deposts crop out in Searsmont, Liberty and Montville and perhaps other places. Clay slate forms a belt across the northern tiers of towns from Burnham and Unity, to Winterport and Frankfort. In Frankfort the clay slate is underlaid by mica-schist. Clay slate is that kind used for writing tablets and roofing. In Clinton, near Burnham Junction, a quarry has been opened, and soon we hope others will be opened in Waldo county. Granite occurs plentifully in Frankfort, Prospect, Swanville and Northport. Of this rock Waldo county has a great abundance, and numerous quarries are in operation in the three last mentioned towns. It also occurs in some other localities, and forms many of the boulders in every portion of the county.

We subjoin a list of minerals found in Waldo county with their localities:

Belfast.....Marl, Plumbago, Molybdenite.
Brigadier's Island.....Plumbago, Pyrites.

Islesboro' .....Talc.
Frankfort.....Feldspar crystals.
Prospect.....Jasper, Galena, Plumbago.
Brooks.....Plumbago, Pyrites.
Winterport.....Graphite, Pyrites, Asbestus.
Searsmont.....Toumaline, Andalusite.
Stockton.....Pyrites.
Searsport.....Pyrites, Quartz crystals.
Troy.....Pyrites.
Liberty.....Granular quartz.
Waldo.....Toumaline.
Lincolnville.....Graphite, Phosporent blende, white granular limestone.
Northport.....Gold.

(*Obs.* Gold was found in the crops of ducks killed by Mr. Mark Knowlton, on his farm at Northport, in the fall of 1862. They frequented a ditch recently dug through his field. Mr. Knowlton is an old Californian, and had the gold tested in Belfast.)

Jackson.....Mica crystals.
Thorndike.....Quartz crystals.

Water-Power and Manufactures.

Waldo county possesses abundant water-power, much of which is not yet developed. Much of it is only partially used. The numerous large ponds in the county form vast reservoirs, whose overflow when developed, will be the means of adding millions of dollars to the wealth of the county. Numerous sites abound for factories and mills where an abundunt supply of never-failing water would insure driving them the entire year. The bracing climate insures better health to the operatives in manufacturing establishments in Maine than in those of any other State in the Union. Waldo county sends its surplus waters in five directions —east, into the Penobscot river; south-east, into Penobscot bay; south, into the Atlantic; south-west into the same, and north-west into the Sebasticook, thence to the Kennebec. It therefore lies partly in the two great basins of the Kennebec and the Penobscot. Granite for dams and canals, abound in near proximity to all available sites, and lumber exists in sufficient quantities for building purposes. Waldo county is situated on the southern slope of

Maine, which is characterized by its general pitch seaward. The slope is not rapid, but enough to insure good drainage and at the same time easy control of water, and the slope is uniform from its upper limit to the ocean, insuring many available facilities for use along its whole breadth. The brokenness of its surface, the hardness of its rocks and the arrangement of its natural reservoirs, affect favorably the relations of this southern slope to manufacturing needs. Waldo county is situated near the center of this southern slope; a maritime county, and partakes fully of its favorable features. The tidal water-power on the seashore of the county is great, and may be made available for small manufactures. The mean height of tides in Penobscot bay is, at Castine on the eastern side, twelve feet, at Camden on the western side, nine feet eight inches.

Another consideration which we would not here overlook while upon the water-power and facilities for manufacturing offered by the county, which is this,—the proximity to the seaboard and points of shipment. No monopoly of transportation can ever injure the manufacturer in Waldo county, for on its short routes of travel to the seaports competition will ever exist, and when railroads raise freights above a certain point, which is to be determined by actual cost, teams will come in and do the trucking. A case in point: The Belfast Branch, under control of the Maine Central Railroad Company, charges five dollars per ton to transport hay from Brooks to Belfast—twelve miles. The consequence is no hay is sent by rail, for teams will draw it for two dollars per ton. The same coporation only charge $7.90 per ton for hay from Brooks to Boston—$2.90 more than to Belfast—and a difference of 213 miles. So from any point on the railroad, monopoly of transportation can never be had by them, a great advantage to the citizens, and especially to manufacturers.

The heights given in the survey of the Belfast and Moosehead Railroad, make Webb's ledge, Brooks, 350 feet above high tide at Belfast; Jackson, 450 feet; Unity, 400 feet.

Belfast—Ten or more powers. On Goose river, which empties into Belfast bay opposite the whaves of the city, on the eastern side of the harbor. Fall 185 feet in three-fourths of a mile, the river running that distance over a ledge. It flows from Goose pond in Swanville, six miles from Belfast, which pond contains thirteen hundred acres, with a great depth, and a large watershed draining into it. It is also fed by springs from its bottom,

which make a steady supply of water during the entire year. At the outlet of the pond is a solid stone dam, so that there has never been nor can be any freshet upon the river to do damage to buildings or dams, that are or may be erected thereon. About one-half the power upon this river is now used. At the mouth of this river near the bay, wharves are constructed so that vessels drawing fourteen feet of water can load or discharge at the foot of a dam now being built, three hundred feet long and thirty feet high, with a thickness at the bottom of twenty-six feet by twenty on top, founded on the ledge. The power is 185 horse, and is not at present occupied.

The next fall above on the same river has 48 feet head—equal to 850 horse-power. The next fall has 15 feet head, and has a stone dam with grist-mill. The next has 14 feet fall equal to 114 horse-power, and is used to drive a paper-mill; has a stone dam. The next fall has 10 feet head and equal to 62 horse-power; also used for a paper-mill power. The sixth power has 18 feet head, and is equal to 150 horse-power. There is a good stone dam, and is used for paper-mill. The next has 10 feet head, equal to 62 horse-power, and drives an axe manufactory, (Kelley's). The eighth power has some capacity and drives an axe factory, (Whiting's). The next has 13 feet and 92 horse-power, and drives a paper-mill. The tenth and last, has 28 feet fall, equal to 240 horse-power; has a stone dam and is unoccupied. Was formerly a lumber-mill. The paper-mills belong to Russell & Sons, Lawrence, Mass. The grist-mill with all powers below to the outlet, belong to H. E. Pierce, Esq., Belfast. At the outlet of Wescott stream, Jas. Kaler has a plaster-mill, stave and lath mill. The plaster rock is shipped here to be ground from Nova Scotia. Mr. Kaler also manufactures another fertilizer composed principally of marine matter, called "Eagle Island Guano."

At the head of the tide are shingle, lath, and stave mills on the Passagassawaukeag river, and also on the same at Poor's mills. This river furnishes a good amount of water-power, being fed by several ponds situated in South Brooks and East Knox; none however of much size. Altogether Belfast is well supplied with water-power and ought to be much more engaged in manufacturing than it now is. It speaks poorly of its thrift and enterprise when such powers as those mentioned on Goose river lie unoccupied.

A shoe factory has been established in the city, giving employment to a large number of operatives. This was built by the company formed of citizens of the city, and by parties from Lynn, Mass., who run it.

H. McGilvery & Co., C. P. Carter & Co., D. W. Dyer, Carter & Perkins, are ship-builders, and carry on the manufacture of vessels and their repairs to a considerable extent, giving employment to several hundred workmen. No place on our coast has better facilities for shipbuilding than Belfast or turns out a better class of work.

The Belfast Foundry Co., the Howard Manufacturing Co., and Fields & Mathews, carry on the manufacture of castings, agricultural implements, furniture, &c., on quite a large scale. There has seemed to be a better feeling toward introducing manufactures since the building of the railroad, and more enterprise manifested by the citizens in this direction.

Belmont—Three considerable powers are here found. First, upon Tilden stream, the outlet of Tilden pond; fall twenty-four feet in half a mile. Second, on Green stream; fall twenty feet in half a mile. Third, on Cross' stream; fall fifteen feet in one-fourth mile. All are connected with a pond two miles in circumference. Capacity can be increased by dams. Two mills on these streams manufacture lumber, and run about six months of the year.

Brooks—Eight—four on Marsh river, two on Sawyer stream, and two on Ellis stream. Average height of the falls fifteen feet. Power is not all developed; mills usually operate six to seven months in the year. Six saw-mills, one grist-mill, two shingle-mills. Ellis stream is connected with a pond that might be flowed several feet. An artificial reservoir used to be maintained and might now, on the Sawyer stream, by building a dam to flow a large bog. This would benefit all the privileges on Marsh river. Not many forest streams rise and fall suddenly except the Ellis (Passagassawaukeag.) Manufacture of lumber well run down. Saw mills going to decay; considerable short lumber left, such as is fit for laths, shingles, staves, &c.

Burnham—Well supplied with water-power by the Sebasticook river and outlet of Twenty-five-Mile pond, which is two by four miles in extent. The pond has been flowed two feet. The Ferguerson falls have twelve feet head, are occupied by a tannery,

two shingle-mills and a saw-mill; 35,000 sides of leather are here tanned annually, and 500,000 shingles and one million feet of long lumber sawed. In the south-easterly portion of the town, on Bog brook, from 200,000 to 400,000 feet of lumber is annually cut and sawn. In the northerly part of the town on Meadow brook, from 400 to 600 M are annually manufactured. Ferguerson Rips on the Sebasticook, ten feet fall in fifteen rods; 1½ miles from Burnham village, Eel-wier-rips in same river, eight feet fall in eighty rods. Thirty-mile-rips, thirty-five feet fall in 480 rods. All these are unimproved, and offer splendid sites for factories.

Frankfort—On Marsh river at the village, with fifteen feet fall; has a wooden dam on a ledge. Power only partly improved with saw and grist mills. Mills can operate nearly the entire year. Flat-rock falls are one-half miles above; unoccupied; very good location for factories.

Freedom—Stream issues from a pond that covers, when flowed, one square mile. Pond fed by springs. Total fall seventy feet. Sufficient water in droughts to use one hundred square inches under ten feet head ten hours per day. First power, flour mill, twenty-two feet head. Second, corn mill, fourteen feet head; these two mills grind 15,000 bushels of grain annually. Third, saw mill and shingle machine, twelve feet head; production 700 M annually. Fourth, woolen mill, with thirteen feet head. Fifth, tannery, with nine feet head. Freshets harmless; stream very constant; stream empties into Half Moon stream.

Islesboro'—Has six powers. On this island is a pond of twelve acres which could easily be increased to double the size. Pond is one-third of a mile from seashore; from pond to sea line is a fall of sixty feet. Two tide powers; one at the head of Sabbath Day harbor, and one at Gilkey's harbor. These powers are used for sawing lumber and grinding grain.

Jackson—Has six powers, the first being on Hadley brook; occupied by saw mill, with fall of fourteen feet. Second on same brook, fall twenty feet; unoccupied. Third, fourth, fifth and sixth on Great Farm brook. The four powers last named have a fall of seventy feet in three-fourths of a mile. Two ponds at head of Hadley brook of twenty-five to fifty acres each. Mills cut 1 M shingles, 8 to 12 hundred thousand boards. No grist-mill or other factories.

Knox—Has several powers on Half Moon stream occupied with saw-mills. About 500,000 of lumber is annually sawn. Knox sends its waters into the Penobscot and Kennebec, being the highest point in the county, and hence has no large streams and little water-power.

Liberty—This town is largely supplied with water-power, having more than twenty-five. On the St. George and Sheepscot rivers, the partial development of this power has greatly benefitted the town. There are lumber mills, an axe factory owned by W. Hurd, Knowlton's wool-skin factory and tannery, R. H. Gilman's foundry and machine shop, L. C. Morse's cabinet works, and several others. Water-power can be increased by reservoir dams.

Lincolnville—On Ducktrap stream, at Ducktrap falls, is a good water-power. This stream is fed by several large ponds and furnishes steady supply. This power is about twenty rods above Ducktrap bridge, and only forty rods from tide water. It has a wooden dam built twenty years ago, and thirteen feet high. A dam of much higher proportions could be sustained at small expense, the configuration of the banks being favorable. A canal could be constructed to convey the water to factories below the bridge so that vessels could load and unload at their side and wharves. Vessels drawing twelve feet can be received by the harbor. The power is estimated to be equal to driving 75,000 spindles; 2,800 acres of pond surface is available for reservoir purposes, and all lying within short distance. The power is now occupied by grist-mill.

On the McCobb stream, also at the outlet of Kendall pond are smaller powers; the latter has stave-mill. There is a saw-mill on outlet of Gould pond, also one at Andrews point. On Stetson pond a stave-mill. Formerly 100,000 barrels of lime was made at Lincolnville. Its manufacture is now somewhat less. W. C. Tower is the only manufacturer at present.

Montville—Is not so well supplied with water-power, lying on the divide between George's river and Penobscot river waters. We find but two powers worthy of note, both at True's mills in south-east part of the town. Upper fall, ten feet; lower fall, seven feet. On these are grist-mill, carding-mill, saw, stave, and shingle-mills, which cut 600,000 feet of lumber, card 15,000 pounds of wool and grind 15,000 bushels of grain per annum.

Mills operate all the year, except the carding-mill. Stream uniform, being connected with three ponds which have four square miles of surface. Granite is abundant for building dams, &c.

Morrill—Sacasawakic (Passagassawaukeag) stream furnishes three powers, the fall of two of which is ten feet each; the other is nine feet. Another stream furnishes a power with some head. Saw, shingle, and stave mills are operated which cut annually about 500,000 shingles, 300,000 laths and 200,000 boards. One small pond in this town, and only one power developed as yet. The mills operate about six months of the year. Lime casks are manufactured to some extent for the Rockland market.

Monroe—This large town is crossed by Marsh river, and has several other streams tributary to this, and to Goose pond. Its principal powers are on the Marsh river. First, the "Willis mill" on Marsh river; fall fifteen feet. Wood and stone dam with ledge foundation. Saw, shingle, and grist-mill with four run of stones. A good site for small factory. Saw-mill cuts 400,000 boards and shingle-mill 800,000 shingles annually. Second, half a mile above, with ten feet fall; power used for carding-mill. Third, power half a mile above on same stream; saw and stave-mill, with ten feet head. Wooden dam on ledge. A very good privilege. Fourth, two miles further up. Saw and shingle-mills, with fifteen feet head. Good reservoirs further up the stream. Mills run nine months of the year. Fifth, just below, with fifteen feet fall in ten rods. Not improved. These powers are not liable to be troubled by freshets. Sixth, "Thurlough mill" on outlet of Northern pond, with stone dam eight feet high. Water brought in canal; fall twelve feet. Dam flows back one and a half miles. Pond contains seventy acres; could be flowed to cover thirty more. Another pond and bog of thirty acres might be flowed. Cuts 200,000 feet of lumber yearly. Ten rods below is a chance for a dam twelve feet high but is unimproved, as are powers given below on same stream. At outlet of Thomas-Chase bog, stone dam eight feet high, which flows water over several hundred acres, two hundred of which has right of flowage. This bog has drainage of southern slope of Dixmont hills; unimproved. Half a mile further down; formerly used for saw, lath, shingle and stave mills. One mile farther on formerly a saw-mill. Eleventh, "Mayo mills," twelve feet head; occupied by a first-class grist-mill. Pond and reservoir in town of Swanville. Twelfth, "Emery mills," on

Emery-mills stream near centre of the town. A dam could be built between ledges, cheaply, to raise fifteen feet head of water and flow thirty acres; occupied by saw and stave mills. Thirteenth, thirty rods below; dam could be built to raise head of water fifteen feet. Fourteenth, twenty rods below there is a fall of forty feet, and offers a splendid site for a factory. By flowing a bog half a mile above the falls, it would be very much such a power as Dexter. In a distance of forty rods there is sixty feet fall. Years ago a grist-mill operated here the year round, and since then a pail-factory; unimproved. Fifteenth, at the outlet of Jones' bog, half a mile above the last. A suitable dam would raise a pond to flow 700 acres and give ten feet head. Munroe offers to exempt capital laid out to develop her water-power, and it is one of the few towns in Waldo county that has no town debt. Winterport is another.

Northport—Though not largely endowed, we find four considerable powers here. First, on Little river at head of the tide banks and bed of stream ledge, with average volume of six square feet. Fall fifteen feet; unimproved. On Sucker stream are three powers in north-west part of the town. Fall ten feet, with average volume of three square feet. Occupied with saw and shingle mills.

Palermo—This is one of the largest towns in Waldo county, and is well supplied with water-power. It drains its waters by way of the Sheepscot river, in a south-west direction. Ten good powers exist. First, at "Marden's shingle and stave-mill;" also drives grist-mill and rake manufactory. Operate eight months in the year. Second and third on Little river; unimproved. Fourth, on the main Sheepscot river; fall ten feet; mill in decay; stream fed by ten ponds. This privileges is about one-fourth mile below the outlet of Sheepscot great pond, which is three miles long and one mile wide. Ponds can be flowed easily for reservoirs. Next two powers are on a stream that runs into west branch; occupied by saw and shingle-mills. Rock for dams abounds. The other powers of the town are of less note and are unimproved.

Prospect—Three considerable powers; the first on Grant's stream with head and fall of eight feet. The second and third power also on same stream. Saw-mill on each, but two are decaying. There is also grist-mill. Stream is variable, but has capacity of 300,000 lumber, and to operate mills two-thirds of the time. Plenty of granite and streams are ledgy. Wilbur, Grant & Co. carry on cooperage and stave business.

Searsmont—Well supplied with water-power. The west branch of St. George's river furnishes eight powers, and the east branch and tributaries seven more, making fifteen in all. First, at "Woodman's mills" on West branch; saw and stave-mill, which operates only part of the year on account of flowage of meadow grass-lands. Second, at a point two miles below. Here are two powers known as the "Boynton privileges" both unoccupied. Head of sixteen feet can be raised and large pond flowed. Fourth, one mile further down, and known as the "Muzzy mills." Saw, stave-mill, and tannery. Fifth, just below the last and unoccupied. Sixth, just below the "Hazeltine mills" in Searsmont village; occupied by saw, grist, carding, stave, and shingle mills. This power is steady, and mills operate all the time. A head of eighteen feet can be had. Seventh, two miles below, known as "Dyer mills;" saw, stave and shingle mills. Operate six months of the year. Eighth, half a mile below, known as the "Canal Dam;" unoccupied, and a head of twenty-five feet can be had. Quantabacook pond can be used as a reservoir for the two last named privileges. Pond covers one and one-fourth square miles. Ninth power is found in north part of the town, on east branch, at "Thompson's Mills." Tenth, one mile below at the "Wallace dam" and unoccupied. Flows a large intervale. Eleventh, one hundred rods below at the "Jewett mill;" occupied by saw-mill and stave-mill. Twelfth, in the west part of the town, known as the "Arnold Privilege." Thirteenth, one hundred rods below, occupied by Morse's stave-mill. Fourteenth, half a mile below; occupied by Woodcock's saw, stave, and cabinet mill. Rock abundant for dams. Lime is manufactured in this town by Edward Burgess, and is of a very fine quality. Considerable cooperage is made for the sea-board markets.

Searsport—Has eight powers on Big Meadow and Half-Way streams, and all are small. The power is nearly all improved, by one grist, two flouring, two stave, three shingle, and several stave-mills. Rock for dams abundant and good for building purposes, being granite. A spool factory has recently been established, and is doing a prosperous business; Geo. Merrill is proprietor of the enterprise. Searsport has several ship-yards, and is engaged largely in ship-building. Wm. McGilvery and Carver & Lane are the ship-building firms.

Stockton—Is also extensively engaged in ship-building—or has been—and owes much of its wealth to this industry. N. G. Hichborn, H. S. Staples, B. F. Rice, C. S. & O. Fletcher are ship-building firms. Thompson & Griffin manufacture doors, sashes and blinds. Stockton has three powers: First, tide-mill power at the village, with eight feet fall, with saw, shingle, grist-mill, sash and blind and block shop. Second, on "Perkins' stream," Sandy Point. Small but never failing stream, occupied by carding and clothing-mill, with eight feet head. Third, the "Robert's mill," on Seavey stream, with fall of eight feet; a saw and shingle-mill operates eight months of the year.

Swanville—Has three powers. First, "Swanville mills," at outlet of Swan lake, (Goose pond.) Fall ten feet, with stone dam. This is occupied by a saw-mill owned by the Belfast Paper-Mill Company. Worked only when paper-mill wants water, the lake serving as a reservoir to said mills; lake contains three square miles. Second, "Nickerson mills," on Dead brook; fall eleven feet; operates six months of the year. Third, "Marden privilege," on same stream; nine feet fall; unimproved. Two small ponds are connected with this stream.

Thorndike—Three powers, which are small and operate only four months in the year. Two saw-mills and three shingle machines. No other manufacturing in this town worthy of special note.

Troy—Ten powers. First, at outlet of "Carlton bog," which contains about 1,000 acres. Shingle, clapboard, saw, stave and grist-mill; 300 M lumber, 350 M shingles, 30 M clapboards, 1,600 bushels grain are manufactured annually. Has thirteen feet head. Dam in poor condition. Reservoir dam above might, with trifling outlay, flow 3,000 acres. Forty rods below is the second power; nine feet head; unoccupied. Third, one mile below; unoccupied. Fourth, the "Myrick falls," in the south-western part of the town. Occupied by saw-mill that cuts 150 M lumber annually; has head of twelve feet. Hard bottom at all these privileges; water sufficient for nine months of the year. Fifth, twenty rods below; occupied by shingle-machine, which cuts 300 M shingles per annum. Sixth, below; unoccupied. Seventh, on Martin stream; occupied by saw-mill which cuts 150,000 lumber per year; runs three-fourths of the time. Eighth, below; good bottom and head;

unoccupied. Ninth, clover-mill, on "Shaw brook." Hulls ten or twelve tons of seed per year; runs six months of the year, with head and fall of eleven feet. Plenty of stone about for raising dam. Tenth, half a mile below; occupied by shingle-mill which cuts 200 M shingles per year. Good bottom; water sufficient to run mill eight months of the year.

Unity—Four powers. First, "Thompson mill;" grist, saw, shingle, clapboard, picket, lath and stave-mills, all on one dam; on Twenty-Five Mile pond stream. Area of pond four and a half square miles. Mills operate the year round. Second, "Stevens' mills," on Sandy stream; grist, carding and clothing mills. An excellent power, beautiful falls and large flowage. Third, "Conner's mills," on same stream; occupied by a large grist-mill. Fourth, "Small's shingle-mill," a small but nice power; large tanneries used to operate at Unity village, on the stream, but they are now in ruins. Hemlock bark becoming scarce, other and more favored localities could pursue the business at better advantage.

Waldo—Seven powers, the "Hawkins' mill" being first, on a brook fed by three small ponds in the north-west part of the town. Saw and stave-mill, which run from fall to spring. Second, above—Pitman's saw-mill saws three months of the year. Third, on same stream, in south-west corner of the town. Dam remaining; mill burnt some years ago. Fourth, above; about centre of town, known as "Sanborn mill;" on Passagassawaukeag stream, which is fed by three ponds situated in Brooks and six more situated in Waldo, Morrill, Knox and Brooks. Fifth, in north-east part of the town known as "Johnson saw-mill." Fed by a pond of seventy acres; runs six months of the year. Pond fed by Wescott stream; saw, shingle and stave-mill. Sixth, below; known as "Holmes' mills;" in ruins now; fall ten feet; pond of sixty acres. Seventh, below; known as "Ellis Mill Privilege." Saw, shingle, and stave-mill machinery; water sufficient for six months' sawing each year.

Winterport—Seven powers, most of which are on Marsh river, and range from fifteen to twenty-five feet head. At "Plummer's Mills," "Boyd's Mills" and "Tapley's Mills," the power is utilized to drive shingle, saw, stave, lath, grist and carding-mills; the others are unoccupied. On "Cole's brook" at North Winterport, the "Baker mill" has a head of twelve feet, which drives a stave and shingle-mill.

Meteorology.

The meteorology of Waldo county does not differ essentially from that of other seaboard counties of Maine. It lies more interior than Washington, Hancock, Knox, Lincoln, Cumberland and York, yet has extensive seaboard enough to feel the effects of the sea upon its atmosphere. The Bay of Fundy renders our eastern seaboard counties damp and foggy to greater extent than our western. Long spells of prevailing sea-fog are sometimes experienced, and are known by the technical name of "fog-mulls." These occur most frequently in the hot months of July and August, when the east and south winds prevail. But some years are exempt from these. Our snows are affected by proximity to the salt water, and disappear very rapidly in the spring. Our rainfall is also very much influenced by the nearness to the sea.

The air in the spring and fall, is damp and chilly oftentimes, and proves unhealthy for those of weak lungs. Fevers are sometimes induced from our climatic conditions of damp and cold, and wet and heat. North-east winds from the Gulf of St. Lawrence, usually bring cold rains, and are our most disagreeable storms. Neuralgic diseases prevail at certain seasons, due greatly to exposure to raw chilling winds.

From June to September on many nights, the southerly winds will drive in the sea fog about sunset and it will prevail till after sunrise the next morning; when, most likely, it will be driven out again by the north-west wind. Sometimes this night-fog will prevail till nine or ten o'clock in the forenoon. It generally sends in *avaunt couriers*, so that the watchful hay-makers are warned and consequently prepared for the main body, generally, when it comes a few hours later. These out-riders invariably follow up the river channels, and are seen high over the Penobscot and Kennebec rivers as flying scuds.

But I would not cast the impression that Waldo county is more damp, unhealthy, or undesirable in climate than her sister counties. Indeed this would be untrue. I have but presented some of her prominent features in meteorology as they exist. No climate in all this wide world can surpass our Junes and Septembers. Our winters, though severe, are much less so than those of the west. Our summers, though hot, are not enervating. Our climate, though from its sea influences, damp, is peculiarly bracing. And while some parts might perhaps be modified for the

better, on the whole it has fewer objections than most any other county or State. Longevity is maintained fully with other States of the Union, and in this respect ours surpasses very many. We can boast our centenarians in Maine, as often as that of any other place.

But we find ourselves too often at fault when we attempt to be weather-wise. It is a favorite theme upon which to prophesy, and presents a rich field to the careful and patient observer. It is a field needing faithful workers. The weather is an ever new subject. We find it brings up something for remark almost every hour. What a pleasant day! What a cold snap! What a severe storm! What a fierce wind! These and a thousand other expressions are common-place yet never wear out. They are always original and constantly paraded before us. Then again the last storm, or hot, or cold day, was the greatest, the hotest, or the coldest we ever knew. Some peculiarly novel feature about it exceeds, in our estimation, all predecessors. Our memories are short, and we are the creatures of circumstance. So we allow ourselves to be governed by sensations and present impressions.

Yet how dependent are we on the ordinary phenomenon of the elements. Let there be a little excess of heat, of wet, of cold, of frost, of snow, or of dryness, and we suffer. The past winter is in point: when an unusual depth of snow caused delay of trains, impassible highways, and unsafe locomotion, it required the expenditure of thousands of dollars more than usual to keep the wheels of business moving. A scarcity of wood occurred, amounting to almost a famine—wood enough, yet practically out of reach. It was but a natural inference to suppose that following a summer of unusual rain-fall and moisture we would have but a light fall of snow. The reverse has been the fact. Not only an excessive number of snow-storms but of depth of snow; without rain-fall or mild weather to settle it, or harden the roads. Such depth of snow, accompanied, as was the fact this year without any frost in the ground, is very favorable to the succeeding grass crop. Meteorology is, as yet, a broad field in which but few salient points have been made. It is by the aid of tables like the accompanying, the results of carefully conducted observations running through a long term of years, that general rules are deducted.

It is not my purpose to enter upon any lengthy remarks concerning our meteorology. I shall let what I have said suffice and in this connection present several tables from weather records kept within the county by well-known citizens. They are instructive, and their teachings valuable. They will well repay carefully studying and frequent consultation, when we think "this is the coldest day I ever saw," or "this is the hottest we ever had." The tables of snow-fall will settle "the oldest inhabitant" in future, when he observes, "We never had so deep snow since I was a boy."

TABLE I.—*Mean Temperature of each Month and each year, from* 1852 *to* 1873, *by* J. F. BLAKE, *Winterport.*

YEAR.	January.	Februa'y	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	Whole Year.
1852	14⅜	19⅛	27⅜	40	53½	60⅛	69	64	58¼	44⅛	34	26	43⅜
1853	18¾	20⅛	31	40⅓	53½	62⅛	67⅛	66⅛	58⅛	40	33 1-5	21¼	43⅓
1854	12⅛	13	26⅜	37	54¾	63⅜	71⅜	65⅓	57⅓	48½	38	17¼	42
1855	22⅜	14⅓	27⅞	39	51 1-6	62	69⅜	64⅓	58½	51⅓	36	25	43¼
1856	12¾	17¼	24 1-6	42¾	51½	65½	71½	67⅜	59⅓	50	36⅔	20¼	43¼
1857	11⅜	27⅛	29¼	41⅜	54	62½	71⅛	67½	61	49½	39	27	45
1858	22¾	16⅜	30½	40⅜	49⅔	64⅓	65½	64½	58⅜	46⅓	29¾	15¾	42
1859	14¼	19 1-5	31½	37⅜	53¼	59	65½	65	55⅜	42¼	34⅜	14¼	41
1860	19	17 1-6	32⅔	38¼	52½	62¾	64½	66⅜	55 1-6	47 1-5	40¼	20½	43
1861	11⅜	23⅜	27	39⅔	49⅔	60½	68	67	58	49½	36	23	43
1862	14 1-5	16⅛	32¼	37⅜	53¼	60	65	65⅜	58¼	48	36⅜	21⅜	42½
1863	26	23	23⅔	41	52⅓	58¾	66½	66½	56	48⅜	39	20 1-5	43½
1864	21¾	25¾	32	40¾	54	61⅛	67	66⅛	55⅜	45¼	37⅓	24⅜	44¼
1865	16⅜	23½	34 1-6	43⅓	52⅜	63⅜	65¼	65⅛	62	45	37½	24¾	44½
1866	15¼	23⅓	28¼	44	51¼	61¼	68⅜	66 1-6	59	47	39	25½	44
1867	14	26⅓	28⅛	40	49⅜	62¾	65⅜	67¼	56⅜	47¾	34⅜	16	42½
1868	15⅜	15¼	30¼	37⅓	50⅓	61	67½	66⅜	55⅔	42¾	32½	20¼	41¼
1869	21⅓	24½	25½	40¾	51	59⅓	66⅝	63⅜	61	47	34	25¾	43⅓
1870	25½	22¼	30⅓	44¼	51¾	65⅓	68¼	66⅛	59½	49¼	37½	26⅜	45½
1871	17	22	36 1-6	42¾	51⅓	62	67⅓	66⅓	55⅔	49½	31½	20¾	43½
1872	20⅓	21⅓	22¾	41½	52	64	68⅛	67⅓	59⅜	47	35⅓	16	43

TABLE II.—*Showing the extremes and range of Temperature of each Month and Year, from* 1852 *to* 1872, *by* J. F. BLAKE, *Winterport.*

YEAR.	January.			February.			March.			April.			May.			June.			July.			August.			Sept.			Oct.			Nov.			Dec.			YEAR.		
	Heat.	Cold.	Range.	Heat.	Cold.	Range.	Heat.	Cold.	Range.	Heat.	Cold.	Range.	Heat.	Cold.	Range.	Heat.	Cold.	Range.	Heat.	Cold.	Range.	Heat.	Cold.	Range.	Heat.	Cold.	Range.	Heat.	Cold.	Range.	Heat.	Cold.	Range.	Heat.	Cold.	Range.	Heat.	Cold.	Range.
1852	40	-30	70	50	-34	84	59	-8	67	62	17	45	85	25	60	90	28	62	100	39	61	93	38	45	89	21	68	66	16	50	54	12	42	55	-13	68	100	-30	130
1853	43	-24	67	48	-13	61	53	-4	57	62	15	47	85	24	61	85	32	53	92	43	49	100	37	63	92	32	60	72	18	52	55	-1	56	49	-28	77	100	-28	128
1854	40	-31	71	48	-34	82	50	-7	57	71	2	69	88	30	48	93	30	63	96	48	48	92	40	52	92	31	61	71	24	47	65	3	62	42	-30	72	96	-30	126
1855	46	-6	52	10	-31	71	50	4	46	74	10	64	79	28	48	95	38	55	95	42	53	92	39	38	90	31	58	72	30	42	59	5	54	50	-18	68	95	-31	126
1856	36	-18	54	46	-20	66	56	-27	83	63	9	54	74	26	48	98	40	58	99	45	54	92	39	53	88	38	50	82	27	55	64	13	51	45	-18	63	99	-27	126
1857	36	-45	81	60	-28	88	56	-17	73	62	12	50	89	26	65	88	37	54	98	48	50	92	44	48	89	34	56	76	19	47	62	2	60	44	-3	47	98	-45	143
1858	46	-4	50	42	-23	65	54	-6	50	68	20	48	74	26	48	98	35	63	92	40	52	90	33	37	92	26	66	76	20	56	58	6	52	42	-20	62	98	-23	121
1859	46	-38	84	43	-22	65	52	-9	61	60	13	47	87	26	58	87	30	57	92	39	51	88	37	51	76	25	31	70	10	60	55	11	44	45	-38	83	92	-38	130
1860	46	-24	70	52	-30	82	56	3	53	66	2	64	88	23	65	90	38	52	90	38	52	91	42	49	82	22	60	68	22	46	70	16	54	43	-24	67	91	-30	121
1861	38	-30	68	50	36	86	50	-18	68	64	10	54	78	21	57	83	33	50	92	44	48	88	37	51	86	30	56	74	22	48	54	22	32	44	-14	58	92	-30	122
1862	35	-20	55	39	-22	61	52	-10	42	62	10	52	86	26	60	90	32	58	92	38	54	92	38	54	84	35	49	88	25	63	60	10	50	44	-20	64	92	-22	114
1863	46	-12	58	43	-22	65	46	-19	65	70	8	62	78	30	48	88	32	58	89	45	54	92	44	48	87	28	49	74	16	58	57	12	45	45	-12	57	92	-22	114
1864	42	-14	56	46	-26	72	55	1	54	65	20	45	82	34	48	92	36	56	92	41	53	85	47	38	76	32	44	68	24	44	55	16	39	48	-15	63	92	-26	118
1865	35	-26	61	42	-17	59	50	8	42	62	20	42	86	32	54	90	33	57	88	40	48	90	42	48	90	28	56	72	19	53	64	4	60	53	-5	58	90	-26	116
1866	42	-22	64	48	-12	60	48	5	43	70	22	48	77	28	49	88	36	52	96	46	60	80	44	36	82	34	48	72	17	57	61	8	53	51	-13	64	96	-22	118
1867	42	-14	56	50	1	49	50	-8	58	60	22	38	72	30	42	84	36	48	90	47	43	85	40	45	76	25	51	67	25	42	63	6	57	42	-17	57	90	-17	107
1868	38	-16	54	46	-16	62	51	-10	61	60	8	52	75	25	50	88	38	50	94	44	50	90	38	52	82	31	51	70	14	56	56	8	48	38	-8	46	90	-16	106
1869	45	-10	55	50	-10	60	52	-20	72	60	19	41	80	22	58	86	34	52	90	41	49	86	42	48	80	35	45	78	20	58	52	18	34	42	-2	44	90	-10	100
1870	46	-10	56	48	-14	62	52	-8	60	72	22	50	82	30	52	93	46	47	97	46	51	88	41	49	84	33	51	72	17	55	58	17	41	45	-8	53	97	-14	111
1871	45	-17	62	48	-12	60	54	16	38	68	20	48	92	30	62	92	40	52	88	43	51	86	38	48	82	26	56	70	25	58	58	4	54	46	-8	54	92	-17	100
1872	43	-12	55	45	-10	55	48	-8	56	70	25	45	73	32	41	96	44	52	93	45	48	95	46	49	88	38	50	66	21	45	48	10	38	40	-22	62	96	-22	118

TABLE III.—*Showing the time Ice left the Penobscot river from* 1818 *to* 1873.

1818	May 1	1846	March 29
1819	April 19	1847	April 23
1820	" 18	1848	" 12
1821	" 15	1849	" 1
1822	" 10	1850	" 12
1823	" 19	1851	" 8
1824	" 10	1852	" 21
1825	" 11	1853	" 5
1826	" 5	1854	" 27
1827	" 2	1855	" 15
1828	" 1	1856	" 16
1829	" 14	1857	" 6
1830	" 9	1858	" 11
1831	" 9	1859	March 30
1832	" 19	1860	April 16
1833	" 9	1861	" 11
1834	" 8	1862	" 18
1835	" 17	1863	" 19
1836	" 12	1864	" 8
1837	" 15	1865	March 31
1838	" 21	1866	April 1
1839	" 17	1867	" 18
1840	" 1	1868	" 18
1841	" 17	1869	" 11
1842	March 21	1870	" 8
1843	April 21	1871	March 13
1844	" 12	1872	April 20
1845	" 21	1873	" 20

TABLE IV.—*Amount of Snow-fall, from records kept by* JOHN BRYANT, Esq., *Montville.*

YEAR.	MONTH.	Number of Snows.	Inches.
1857	December	5	12
1858	January	4	12½
"	February	2	9
"	March	2	12
"	April*	4	31
"	November	4	15
"	December	5	20
1859	January	3	20
"	February	4	16
"	March	7	43
"	April	4	7
"	November	3	10
"	December	8	52
1860	January	4	10
"	February	4	15
"	March	5	16
"	April	3	5
"	December	5	23
1861	January	8	53
"	February	6	26
"	March	7	34
"	April	3	5
"	November	4	14
"	December	5	15

* These snows were from 21st to the 28th ; each one being a heavy fall.

TABLE IV.—*Amount of Snow-fall*—Continued.

YEAR.	MONTH.	Number of Snows.	Inches.
1862	January	10	28
"	February	9	32
"	March	7	31
"	April	1	7
"	November	3	10
"	December	4	24
1863	January	6	23
"	February	3	6
"	March	10	39
"	April*	4	23
"	November	3	5
"	December	5	12
1864	January	6	18
"	February	3	15
"	March	3	4
"	April	2	11
"	November	2	8
"	December	6	22
1865	January	8	42
"	February	6	21
"	March	3	3
"	April	2	6
"	October	1	2
"	November	4	10
"	December	6	15
1866	January	3	24
"	February	4	12
"	March	5	14
"	November	1	3
"	December	3	15
1867	January	5	37
"	February	2	6
"	March	5	32
"	April	3	5
"	September	1	2
"	November	2	8
"	December	6	18
1868	January	8	20
"	February	7	27
"	March	5	20
"	April	2	8
"	May	1	8
"	October	2	5
"	November	4	12
"	December	4	13
1869	January	0	0
"	February	8	43
"	March	5	17
"	April	2	2
"	May	2	3
"	October	2	14
"	November	4	8
"	December	4	19
1870	January	6	16
"	February	4	19
"	March	5	20
"	April	1	3
"	October	1	2
"	November	3	8
"	December	5	16

* April, 1863, snowed 7th, 8th and 9th ; 15 inches fell.

TABLE IV.—*Amount of Snow-fall*—Concluded.

YEAR.	MONTH.	Number of Snows.	Inches.
1871	January	4	9
"	February	4	12
"	March	2	10
"	April	2	2
"	May	2	4
"	November	4	25
"	December	7	23
1872	January	4	13
"	February	2	13
"	March	8	26
"	April	2	3
"	November	5	14
"	December	12	45
1873	January	9	18
"	February	7	32
"	March	7	23
"	April	6	12
"	May	1	6

RECAPITULATION.—*Showing the amount of Snow-fall per year.*

YEAR.	Feet.	Inches.	YEAR.	Feet.	Inches.
1858	9	3½	1866	5	8
1859	12	4	1867	9	5
1860	5	9	1868	9	5
1861	12	3	1869	8	10
1862	11	0	1870	6	10
1863	9	0	1871	7	1
1864	6	6	1872	9	6
1865	8	3	1873*	6	9

* Only 5 months of 1873 are included.

TABLE V.—*Summary of Meteorological Observations, made at Belfast, Waldo County, Maine, from January* 1, 1859, *to July* 1, 1873, *by* LUCIUS H. MURCH.

1859.

Observations for this and all the following years were made three times each day, as follows: 7½ A. M., 1 P. M., and 6 P. M. Thermometer in the shade in the open air.

MONTHS.	Mean of warmest day.		Mean of coldest day.		Highest temperature.		Lowest temperature.		Mean of 3 daily observations.
	Day.	Temp.	Day.	Temp	Day.	Temp.	Day.	Temp	
January	21	°41	10	-°18.7	21	°43	10	-°24	°17.70
February	20	36 3	26	7	20	41	26	2	22.58
March	30	44 7	2	10	30	47	2	5	34.52
April	30	53.7	9	30	30	57	9	29	40.79
May	8	69.3	9	44.3	7 & 8	72	12	42	56 22
June	28 & 29	75.7	5	44	28 & 29	79	5	42	62.17
July	13	79.7	4	61	13	83	4	57	69 95
August	5	76.3	31	59.7	26	79	31	56	68.72
September	12	69	21	45.3	12	74	15 & 21	45	58.25
October	4	63	26	30.7	4	68	26	30	44.76
November	13	53	29	22.3	13	56	21	18	37.41
December	7	46	29	-4	7	50	25	-10	18.16
Year	July 13	79.7	Jan. 10	-18.7	July 13	83	Jan. 10	-24	44.27

1860.

January	11	37	2	-1	25	41	2	-10	22.63
February	23	42.3	1	-6.3	23	46	2	-10	21.28
March	31	51.7	10	25.7	31	57	10	21	35.48
April	23	57	2	22.3	23	60	2	21	42.83
May	12	69.7	16	44.3	13	76	1, 16 & 22	43	56.83
June	30	81	20	49.3	14	83	20	49	64.49
July	3	76.7	9	63	26	82	30	58	70.47
August	7	77.3	20 & 21	64	6, 7 & 26	80	15	59	69.63
September	6	76	29	41.3	6	79	29	38	59.20
October	11	57.7	28	37.7	11 & 30	61	28	35	48.10
November	1	57.7	25	25	1	64	29	21	41.65
December	1	38.3	19	4	1	40	19	-5	22.33
Year	June 30	81	Feb. 1	6.3	June 14	83	Jan. 2 and Feb. 2	-10	46 24

1861.

January	25	29.3	12	-5	25	34	13	-10	14.58
February	28	43.3	8	19.3	28	47	8	-22	25.60
March	30	43	18	7	4	47	18	2	29.75
April	22	52 3	1	25.7	22 & 25	58	1	18	42.89
May	31	72.3	2	33	31	77	2	31	54.40
June	27	76.7	3	52.7	10, 27, 28 & 30	79	3	46	65.65
July	5	79.3	2	58.7	5	86	2	57	70.98
August	3	83 3	14	58 7	3	87	14	52	68.36
September	14 & 15	70	30	49.7	7	78	30	45	61.45
October	3	64.3	25 & 28	38 3	7	68	28	33	50.73
November	4	50.3	20	28.7	4	55	21 & 23	26	37.15
December	8	44.3	21	8.3	8	49	21 & 29	4	26.16
Year	Aug. 3	83.3	Feb. 8	-19.3	Aug. 3	87	Feb. 8	-22	45.64

TABLE V.—*Summary of Meteorological Observations*—Continued.

1862.

MONTHS.	Mean of warmest day.		Mean of coldest day.		Highest temperature.		Lowest temperature.		Mean of 3 daily observations.
	Day.	Temp	Day.	Temp.	Day.	Temp.	Day.	Temp.	
January	10	°32.3	14	°1.3	10	°38	14	-°5	°17.81
February	24	33	10	9.3	13	37	11	2	20.18
March	25	42.3	15	22	25	47	15	20	33 67
April	30	54.3	7	29.7	18	60	8	25	42.86
May	23	71.7	2	44 7	18	76	2	42	57.42
June	28	75.3	8	47	28	82	8	44	63 96
July	6	80	3	57.3	6	85	3 & 23	56	68.59
August	3	77.7	24	60	23	83	24	56	68.25
September	9	69.7	30	50.7	12	75	14	47	61.22
October	9	75	26	35	9	82	16, 20, 21 & 26	32	49.04
November	1 & 3	51.7	16	20	1	59	16	14	36.36
December	16	45.7	20	-4	16	49	20	-5	22.48
Year	July 6	80	Dec. 20	-4	July 6	85	Jan. 14 and Dec. 20	-5	45.15

1863.

January	16	43 7	18	5	16	49	9	-2	26.38
February	20	41.3	4	-11 7	20	45	4	-14	23.91
March	26	40.7	13	6	25	45	14	-2	26.35
April	23	61	8	24.3	23	67	8	18	43.29
May	22	81	15	37	22	87	8	34	55.64
June	28	79.3	8	52	28	83	6 & 8	50	64.64
July	28	79	14	56.7	27	84	4	54	69.24
August	3	84.7	26	58	3	90	26	57	70.71
September	16	76 3	26	45.3	16	83	23 & 27	44	58.54
October	1	63 3	26	33	1	69	26 & 28	28	49.84
November	17	54 3	30	17.3	17	56	30	14	39.35
December	14	41.3	10	6	4	44	11 & 21	2	22.24
Year	Aug. 3	84.7	Feb. 4	-11.7	Aug 3	90	Feb. 4	-14	45.84

1864.

January	25	37.7	7	-3.3	25	42	7	-10	22.28
February	24	38 7	18	-2	24	45	18	-10	26.08
March	27	43.7	22	22	27	49	23	16	33.54
April	29	56.7	12	30.3	30	62	3, 4 & 11	28	43.10
May	6	70	3	40.3	31	76	3	39	54 92
June	26	84.7	10	54.3	26	92	10	53	68 30
July	15	78 7	2	57	10	86	2	56	72.84
August	14	78.7	3	59	24	81	4	57	69.48
September	1	69.7	26	47.7	1	74	27	45	58.33
October	7	60 7	30	37	7	66	30	30	46.70
November	10	56.3	24	26	10	58	24	24	38 29
December	1	41.7	23	-7.7	1	45	23	-10	24.54
Year	June 26	84.7	Dec. 23	-7.7	June 26	92	Jan. 7, Feb. 18 Dec. 23	-10	46.53

TABLE V.—*Summary of Meteorological Observations*—Continued.

1865.

MONTHS.	Mean of warmest day.		Mean of coldest day.		Highest temperature.		Lowest temperature.		Mean of 3 daily observations.
	Day.	Temp.	Day.	Temp	Day.	Temp.	Day.	Temp.	
January.....	10	°29.7	16 & 17	°4	6, 9, 13 14 & 31	°33	17	-°10	°16.87
February....	26	35.7	12	2.3	8, 23 & 26	39	12	-4	23.85
March.....	30	45	6	18.7	16 & 20	49	6	12	35.45
April.....	30	54.3	21	36	28	60	1	34	46.02
May.....	31	71.7	3	41.3	17	84	7	37	55.34
June.....	30	84.3	6	58.7	30	88	6	54	68.57
July.....	28	81.3	7	59	21	86	7, 13 & 17	58	70.97
August.....	22	77	24	61.7	22	89	25 & 29	56	70.41
September.....	1 & 12	73	18	48.3	1	86	19	44	66.15
October.....	2	58.3	28	28.7	2	68	28	26	45.83
November.....	17	53	11	20.3	17	61	11 & 12	18	37.88
December.....	27	48	23	3.3	27	50	31	.....	25.98
Year.....	June 30	84.3	Feb. 12	2.3	Aug. 22	89	Jan. 17	-10	46.93

1866.

January.....	1	35.3	7	-12.3	1 & 20	38	7	-20	16 53
February.....	24	46.7	7	1.7	23	50	7	-7	24.12
March.....	16	39.3	10	18	16 & 28	44	8	11	29 24
April.....	19	62.7	9	40.3	19	71	22	35	46.93
May.....	29	66 3	3	47	13	73	17	40	54.91
June.....	26	84.7	4	52.3	26	86	2	50	65.37
July.....	8	86	23	61.7	8	91	19	57	74.06
August.....	3 & 12	72.7	16	57.3	4	78	17 & 21	52	65.62
September.....	3	71.3	20	50.7	3	76	24	45	61.34
October.....	1 & 8	62 3	29	32.7	1 & 8	68	29	26	49.37
November.....	29	56.3	25	22.3	8	59	25	18	40.66
December.....	24	49.7	21	6.3	24	51	21	.....	27.88
Year.....	July 81	86	Jan. 7	-12.3	July 8	91	Jan. 7	-20	46.34

1867.

January.....	22	31.7	30	-1.3	22	34	20	-6	16.13
February.....	14	46.7	20	7.3	14	52	20	2	27.76
March.....	31	47.3	3	12.7	31	48	3	10	30.27
April.....	16	55	13	31	16	58	13	26	43.61
May.....	28	66.7	5	42.7	27	70	5	40	51.99
June.....	29	75.7	3	60.3	23 & 28	80	3	57	68.91
July.....	24	82.7	6	57.7	24	86	13	50	70.26
August.....	21	76.7	31	59.7	19 & 29	80	21	54	69.66
September.....	2	67	30	37.3	2	71	30	34	58.88
October.....	18	62.7	23	39	19	70	26	34	48.14
November.....	4	51.3	19	13.3	2	58	19	12	33.90
December.....	26	38.7	9 & 12	-3.3	28	40	9 & 12	-10	15.33
Year.....	July 24	82.7	Dec. 9 & 12	-3.3	July 24	86	Dec. 9 & 12	-10	44.57

TABLE V.—*Summary of Meteorological Observations*—Continued.

1868.

MONTHS.	Mean of warmest day.		Mean of coldest day.		Highest temperature.		Lowest temperature.		Mean of 3 daily observations.
	Day.	Temp.	Day.	Temp.	Day.	Temp.	Day.	Temp.	
January	24	°32.3	12	°2.7	24	°35	5	-°2	°15.52
February	20	33	3	2.3	21	42	12	-6	16.18
March	14	47	2	-1	14	48	2	-2	31.55
April	16	53.7	10	26.2	16	59	13	20	40.21
May	27	62.7	8	36	27 & 31	66	8	34	51.88
June	26	77.3	7	54	27	82	12	51	65.00
July	11	76.3	24	59.3	71	30	25	57	68.77
August	24	74.3	28	63.7	15	78	28	59	68.94
September	1	68.7	17	47.7	1	72	17 & 22	45	57.08
October	8	64	30	31.3	8	68	30	26	44.03
November	1	52.7	17	21.3	1	54	17	17	33.79
December	8	36.7	27	8.7	8	39	27	-2	22.10
Year	June 26	77.3	Mar. 2	-1	June 27	82	Feb. 12	-6	42.92

1869.

January	8	40.7	22	1.3	8	47	22	-2	22.85
February	13	40	2	16	13	44	2	10	26.92
March	28	48	5	7.7	27 & 29	50	5	3	29.17
April	26	56 3	4	34	28	60	4	31	45.80
May	26	71.7	2	38.3	26	77	2	36	55.22
June	3	74 3	11	55.3	3	80	1	51	64.42
July	11	81.3	21	59.3	11	83	1 & 21	59	70.87
August	3	73.3	31	59.3	3 & 20	78	17, 29 & 31	58	67.13
September	9	71.7	28	48	8	76	28	45	62.56
October	1 & 3	66	28	30.3	1 & 3	71	28	26	48.87
November	6	50	25	25 3	4,5&21	54	26	20	36 34
December	1	46.3	6	8.7	1	53	4	3	27.88
Year	July 11	81.3	Jan. 22	1.3	July 11	83	Jan. 22	-2	46.50

1870.

January	23	42.7	14	-3 3	23	45	14	-7	27.76
February	15	41	4	2.7	15 & 19	46	4	-5	23.67
March	30	44.7	12	15	30	49	12	7	31.73
April	27	60.7	4	33.7	27	69	4	31	47.15
May	20	72.7	10 & 24	41.3	20	80	10	39	56.21
June	25	79	10	55	25 & 28	83	10	51	67.98
July	24	87.7	5	61.3	24	92	5	58	73.01
August	10	79.7	27	64	10	84	27 & 30	60	70.87
September	1	72	12	53.7	1 & 4	76	12	51	62.12
October	2	63.3	27	34.7	2	68	27	30	51.23
November	3	55.3	30	26.3	3	57	30	21	39.22
December	2	40	25	6.7	2	45	25	0	27.36
Year	July 24	87.7	Jan. 14	-3.3	July 24	92	Jan. 14	-7	48.19

TABLE V.—*Summary of Meteorological Observations*—Concluded.

1871.

MONTHS.	Mean of warmest day.		Mean of coldest day.		Highest temperature.		Lowest temperature.		Mean of 3 daily observations.
	Day.	Temp	Day.	Temp	Day.	Temp.	Day.	Temp.	
January	16	°42	26	-°8	16	°45	26	-°14	°18.23
February	25	44.3	5	-1	25	47	5	-10	23.91
March	12	49.7	24	29	11	56	20	24	38.24
April	21	58	2	36	21	64	2	32	44.90
May	30	83.3	5	27.3	30	88	5 & 6	36	56.75
June	3	84.3	16	59 3	3	89	16	55	67.37
July	13	79.7	26	62.7	9	83	23 & 26	60	70.96
August	7	75.3	21	11	12	79	31	56	68.98
September	3	72 7	15 & 22	49	3	76	15 & 22	46	58.08
October	11	64.3	21	37.7	11	68	21	32	50.48
November	1	51	30	9.7	1	54	28 & 30	6	32.92
December	4	41	21	-6	4	43	21	-9	21.23
Year	June 3	84.3	Jan. 26	-8	June 3	89	Jan. 26	-14	46.00

1872.

January	73	35.3	7	2	13 & 23	39	7	4	21.18
February	21	35.3	23	8.7	21	41	1 & 23	1	23.48
March	28	39	6	-3	21 & 28	43	6	-8	24.24
April	30	56.7	1	30.7	30	64	1	26	44.93
May	26	33.3	5	44.3	19	71	5	40	55.10
June	30	84.3	5	52	30	87	5	49	66.42
July	1	83.3	24	61	1	87	27	57	71.29
August	9	79.7	30	55	9	83	30	53	68.43
September	8	72.3	29	55	8	78	29	51	60.16
October	7	60.7	28	36.7	7	64	28	33	47.89
November	7	45.3	30	24.3	7 & 13	48	21	18	36.15
December	3	37	25	-7.7	3	38	25	-17	17.80
Year	June 30	84.3	Dec. 25	-7.7	June 30 and July 1	87	Dec. 25	-17	44.75

1873.

January	17	40.7	29	4.3	17	43	30	-6	20.40
February	8	33.3	2	1.7	7 & 27	38	2	-2	21.08
March	30	39.3	24	20.7	16	45	25	15	31.50
April	28	53.7	2	35	25, 26, 27, 29 & 30	56	2	33	43.24
May	29	72 3	3	35	29	74	3	35	55.85
June	27	77	4	48.3	27	82	5	46	62.98

TABLE VI.—*Showing the mean temperature of the different seasons in each year from* 1859 *to* 1873.

YEARS.	Springs.	Summers.	Autumns.	Winters.*
1859	43.84	66.95	46.81	20.69
1860	45 05	68 20	49.65	20.83
1861	43.68	68.33	49.78	21 38
1862	44.65	66.90	48.86	24.26
1863	41.76	68 20	49 24	23 53
1864	43.85	70.21	47.77	21.72
1865	45 60	69 98	49.95	22.21
1866	43 69	68.35	50.46	23.92
1867	41.96	69 61	46 97	15.68
1868	41.21	67 57	44.97	23.96
1869	43.38	67.47	49.26	26.44
1870	45.03	70.62	50.86	23.17
1871	46 63	69.10	47.16	21.96
1872	41.42	68.71	48.07	19.76
1873	43.53	.....	.....	.....
Average temperature, 14 years	43.70	68 59	48.56	22.11

* The mean temperature given for the winters is for the December of the year named, and the January and February of the following year; so that the figures in the line for 1859, under the head of "Winters," are for the winter of 1859 and '60, and so on for each succeeding year.

TABLE VII.—*Showing the average temperature for* 14 *years of each of the months.*

MONTHS.	Temperature.	MONTHS.	Temperature.
January	°19.74	July	°70.88
February	23.54	August	68.94
March	31.66	September	60 24
April	43 95	October	48.21
May	55.20	November	37.22
June	65.95	December	22.96

Grass Production.

Maine is noted as a grazing State; it is largely engaged in hay production, and not only produces what is consumed within its own borders, but exports largely this material pressed in bales of two to four hundred weight. Waldo county, in proportion to its area, has shipped more hay west and south, than any other sister county; and this alone has been vastly damaging to its soil. There are very many farms that have paid for themselves, over and over again, with the sale of this one item of farm products. In addition to the sale of hay in bulk, various other products have been extensively sold off, such as potatoes, oats, barley, and even straw, and these once teeming fields that bore bounteous havests, now show a deplorable state of deterioration.

Many of our farmers started in life with no other capital than strong wills and stout hands, and trained to habits of economy and industry. After working out a few years, as farm hands in summer, in the woods as lumbermen in winter, laying by a few hundred dollars, they bought farms, paying in what they had, going into debt for the balance. The annual payments, interest and taxes, were to be met with sales of hay. Often a contract was made between the purchaser and seller, the latter to receive so many tons of hay per annum, "such as the place cuts," at so much per ton, till the debt was paid. The usual contract was ten tons of hay per year for ten dollars per ton. This was delivered at some shipping point by the man who furnished it. Year after year the bulky products of hay and potatoes, the latter sold to buy western corn and flour and groceries, have been sold off from many of the farms in Waldo county. Many have sold in addition to these, various grains, more or less extensively as they happened to raise. Very often the farm when paid for by hay selling, would be sold to some other man who would repeat the skinning practice. Other farms have spared yearly a portion of their hay, and potatoes have been largely produced as a market crop.

We believe a turn of the current is to be experienced, and a new departure taken. We trust with the awakened interest in establishing manufactures, developing our natural resources, introducing associated dairying, the establishment of Farmers' Clubs, and the better diffusion of intelligence and education among the masses, a new impulse will be given toward the better state of things so much needed; that means adequate to ends to be accomplished will be used. We are not behind our sister counties in thrift, vigor or enterprise; we are not lacking in natural resources or a desire to develop them. We have many facilities not enjoyed by other counties, and equalled by none. We have the foundation for a higher system of farming than now prevails. It only remains for us to put forth our best efforts in the right direction, use present knowledge to the best ability, and pursue that liberal course of policy adapted to secure coöperation and prosperity. *We must abandon low farming.*

The grasses most cultivated for forage crops are, with us, Timothy or herds-grass, red-top and foul meadow. There are various other grasses, both wild and tame, which are useful both for grazing and hay, but not in sufficient repute to warrant extended notice here. The forage plants of the clover family are

largely produced; the red and white varieties principally for forage purposes. We have yet to adopt the practice of summer tilling with clover; thus adopting an easy means of fertilizing and one in long use with the thrifty farmers of other States. The Alsike clover is working its way into favor, especially with bee-keepers. We believe it to be adapted to nearly all our soils and a valuable addition to our forage crops. It should be sown with herds-grass, as alone it has a habit of falling down which renders it bad to harvest. One fault with farmers of Waldo county, is the using of too few varieties in seeding down to grass. One of the effects is a poor "catch" and consequent thin sod, and general unproductiveness. Moist soils, either flat lying or moderately inclined, are best adapted to grass culture. Of these we have a great abundance. Our high hills and short ridges are exposed to deep freezing occasioned by snow being blown off, and are unfit for the production of grasses for hay, or for culture of hoed or grain crops. These lands, however, make tolerable pastures, especially for sheep. They should be seeded with hardy, strong-rooted grasses, many kinds of which are at home in such situations. The lowlands, and lower lying parts of the farm, will receive the waste wash of these, and be benefitted thereby. Another use for the high bald hills of our county would be, (and we believe it the best use to which they could be put,) to reclothe them with forest growth of which they were denuded years ago. These protecting wood-capped hills would then afford profit by growth of wood, and protection to fields as wind-breaks. Perhaps no purpose to which they could be put, would yield a greater per centage of profit. They would attract moisture, afford rich washings to the fields and pastures below, temper the fierce blasts of winter and the heats of summer, shelter insect destroying birds, and afford beauty to the landscape. We believe scarcity of wood and intelligent culture will, not far in the future, accomplish this.

Lumbering was the leading branch of industry, formerly, in Waldo county. Early in the history of New England, Penobscot Bay was a resort for fishermen and traders. Trading posts were early established at Castine and Fort Point. The excellence of its lumber became known and attracted lumbermen, and after them the pioneer settlers. Farming was secondary so long as her magnificent forests continued to yield their profitable harvest. As the shores became settled, there sprung up a new industry—ship-building. The forest furnished the lumber and the sea a pathway

for transportation. Vessels were needed for carrying surplus lumber to market, and to return with articles of comfort and luxury. Vessels were also needed for fishing. And here began a new occupation for the shore inhabitant—the manning of the vessels built. Not until lumbering failed did farming come to the front. Having no lumber to sell, the settler then produced hay, grain and potatoes, for export and sale. This became necessary more especially after wheat raising was nearly abandoned, in consequence of depletion of soil and the ravages of the midge; and it has helped to place some of the best farms, naturally, where it will take years of judicious management, recuperation and considerable outlay, to restore them again to where they once were in the scale of fertility. This selling hay is not a thing of the past, as any one will see who visits our seaport towns, or passes over our railroad. The amount shipped gradually decreases, from the very fact that less and less is produced, except in those exceptional years, when under favorable circumstances Nature puts forth, as it were, spasmodical efforts to give luxuriance to her abused and depleted fields. The general average will be found lessening from year to year, and not only in quantity but quality also, and soon a limit will be reached, and when we see an increase of acreage each year that does not pay for harvesting, the poor stand of grass obtained upon newly seeded pieces, and the increase of weeds, wild grasses and bushes in our fields, we cannot assign that limit to the far future under the present and past farming programme. Where our hay is sold away from the farm, our potatoes shipped away, and even most of the small grains produced sold too; while the straw, poor hay, and refuse materials only animalized and made into manure, we may expect poor stock, scant manure heaps, and those of poor quality. We may also expect a down-hill move in all that pertains to agriculture, for these are no part of good husbandry. We have spoken in a general way, and are glad to note there are many noble exceptions, but candor compels us to say that the general aspect is not what is desirable, possible, or what we hope it may shortly be. We also hope the tide is at its lowest ebb in this matter, and that a reaction is about to be experienced by the introduction of new forms of industry and new branches of farming. Manufactures will create home markets, give employment to our young men and women at home, and make a demand for many products easily cultivated, but not now of paying value.

Waldo county has much interval land of character to produce excellent hay. Many of its streams and ponds are bordered with large extents of meadow and interval land. There are many swales, low lands, sites of former swamps, and moist hill lands, that are fine grass lands; some of which need draining, while many are cheaply drained from their situation and composition. Some are not needing to be drained, but want clearing and seeding. Lands of this character—natural grass lands—are being sought for and appreciated more and more each year. Marsh river is bordered nearly from its source to its mouth by intervals and meadows,—thousands of acres in the aggregate; so are many of its tributaries. The Passagassawaukeag has some fine grass lands on its course. The southern and south-western portions of the county have considerable low meadows beside the streams. Considerable is also found in Unity, Burnham, Palermo and Freedom. Knox has but little, being the most elevated town; while Thorndike and Troy also have but little land of this kind.

Fruit Culture.

Waldo county has many fine orchards, yet is not so largely engaged in this branch as Kennebec, Franklin or Oxford counties. It has the soil and situation to warrant more extended operations in fruit culture than has yet been entered upon. The rocky hillsides and uplands afford sites for orchards, and are adapted to little else except pasturage. These have strong soils, and produce strong healthy trees. It is evident, even to the casual observer, that one of the most neglected things upon the farm is the orchard, taking the county as a whole. The old pioneers who settled in the then wilderness fifty to seventy-five years ago, and began to hew out farms for themselves, started nurseries upon their first clearings, and transplanted in due season to grounds newly cleared for the future orchard. Many of the original orchards yet remain, some vigorous, others declining; but generally are found either wholly dead and decayed, or nearly so. Young orchards are of frequent occurrence,—some in bearing, others beginning, and still more that have been set but one, two or three years.

There seems to have been neglect in starting orchards after the first ones came into bearing, till they began to show signs of failing, or were too far gone toward unproductiveness, consequently

we see comparatively few orchards of twenty or thirty years of age—those in the height of maturity and vigor of ample bearing. This neglect reduces what might be the full production of apples in the county. Recently, however, stimulated by better knowledge, a better endeavor to improve, and failure of the old orchards, together with appreciation of profitableness, attention has been turned to setting out young trees for future orchards, and thousands have been planted out yearly in every town.

Perhaps the indefatigable "tree agent" should come in for his share of praise—or blame—as the trees prove good or bad, as an aid toward the largely increased breadth of trees put out. New York nurserymen, through their agents, canvass each town, and supply all the people can be coaxed to subscribe and pay for. Each town spends from $300 to $500, and sometimes as high as $1,000 or $2,000 annually for Western trees. This is an item of expense that well might be saved at home, and, to say the least, just as good trees secured. It will be seen that an enormous amount of money is usually and annually carried out of the State, a large percentage of which goes to pay for packing, transportation, and agents' commissions; and even after paying the high prices, often only refuse trees are secured.

We have taken some pains to see how Western trees were doing that had been put out in Maine. In the investigation of this subject we have found that where set out with care, in a good suitable soil, and well tended, that they thrive quite well, but as a whole are not as hardy as native trees. Considerable fault is found by purchasers, who find upon their fruiting, many of them are anything but what they ordered, or what they were labeled.

There are several nurseries in the county conducted by honorable, upright men, where trees can be purchased true to name, and every way reliable, and where for the price of Western trees, one can have his choice from thousands,—an advantage to the experienced of no small account. We hope the day is not distant when Waldo county will supply to her farmers all the trees needed, and save at home the money now sent abroad. With proper precaution against the snows of winter, which sometimes break down the little trees, there are but few drawbacks to successful and profitable nursery raising.

The borer is not found in very great abundance in Waldo county, except in a few localities. Far less trouble is experienced with this pest than in the western part of the State. This is an

advantage of no small importance. A successful orchardist related to me his method of drawing out this "varmint." He bores into the trunk of the tree infested, near the ground, with a bit proportioned to the size of tree, and puts in a spoonfull of sulphur. This should be done when the sap is in circulation. He always drives him out, and sometimes finds him dead at the mouth of his hole where he entered. After putting in the sulphur the bit-hole should be closed with a cork or pine plug. This is certainly a cheap mode of exterminating Mr. Pod-Augur, and one easily tried.

The tent caterpillar is a cause of serious annoyance in the spring, in some sections. The quickest and best way is to go over the trees in the morning or just at night, and as soon as the tents appear, crush tent and inmates with the thumb and finger. Going over the trees in March and cutting off those limbs that have deposits of eggs upon them, is a good plan. The coddling moth is also another and perhaps the worst enemy we have to the apple crop. Where the wind-falls, which are generally wormy apples, are eaten by swine or sheep as soon as they fall, this nuisance, from destruction of the larvæ becomes greatly abated in a few years.

But the great and vital point of failure in making our orchards what those of the best sections are, and what they well might become, is want of care. "Eternal vigilance is the price of good fruit," said a successful farmer to one who sought information of him. We set out enough trees, pay high price enough for them, *mean* to do well by them—to fence and prune and cultivate them—but fail of so doing as we ought. The dead stubs of starved trees, or those hooked to death by cattle, too often dot the fields near our homesteads. Too often, also, trees are planted out in heavy soil and die of suffocation or stagnation; sometimes in a poor soil and their vitality becomes so reduced that they fall an easy prey to insects and severity of winter. But these are only exceptional cases, as a better state of things prevails generally.

The Baldwin is the leading variety of apple with us. Its many fine qualities give it rank and preference over others in the markets, and have made it the standard for quality. The Rhode Island Greening, Roxbury Russet, Naked Limbed Greening, Porter, Alexander, Killham-hill and Early Harvest are well-known varieties among many others that are prominently known. Mr. B. B. Stevens of Montville, exhibited above sixty varieties at our

county fair; George Swett of Belfast, thirty-six varieties; H. S. Webber of Monroe, forty varieties; W. G. Sibley of Freedom, a large number, which will give the idea that we are not without a large list of choice apples adapted to our soil and situation. Orchards do well in our shore towns, and some of the best fruit in the country is raised therein. It is a prevailing custom to use rock-weed as a mulch and we have seen it hung in the branches of the trees, but for what particular object we were unable to see, unless it was to dry it! As a mulch, however, it proves to be very good, and of much utility. We are inclined to the opinion that our shore farmers give better attention to their orchards than the generality of those in the interior towns. This may be only an opinion.

Limb-grafting prevails and gives better satisfaction than stock-grafting. Both saddle and cleft-grafting are practiced; the great fault of all grafting seems to be the practice of cutting off the limb to be grafted too near the tree. It should be left a foot long, if possible, which will give greater flexibility to the branch, and consequently a stronger limb. It also allows recutting lower down the following year, and regrafting should the first one fail. It is not unfrequent to see orchards whose ungrafted branches are bearing natural fruits, much of it unfit for other purposes than cider, or feed for stock. But good fruit only pays, and our farmers, those who did not realize it before, are now learning it.

Waldo county has great adaptability to the production of small fruits, and has much first-rate cranberry land. The currant, gooseberry, and various kinds of plums, do well, as also strawberries, raspberries and blackberries, which have been enough cultivated to test their productiveness. Hitherto the abundance of the wild vines and cones has precluded their cultivation, except in cities and villages. But a gradual failure of the supply, and an increasing demand for them in the markets, have had a tendency to turn attention somewhat to their cultivation. The grape, which formerly was almost unknown, now has a site upon nearly every freehold, and twines beside the door or window of almost every home. It only wants the demand and stimulus to be furnished by development of our water power, creating home markets, to cause a largely increased production of all kinds of fruits, more especially the smaller kinds, which are so healthful and luxurious.

The cultivation of the cranberry is beginning to receive some

attention. Probably no use to which our swampy lands could be put would repay half as well as this. The cost of the cultivation is during the first few years, when the vines are planted and growing, and annually thereafter at the picking season. The high price cranberries bear in the markets, the demand for them increasing with each year, admonishes the planting and culture of this delicious berry.

Wheat.

In the early days of the agriculture of this county, wheat was one of the staple crops. On the burnt lands it grew rank and yielded heavily. It was reaped, bound and stacked, and threshed by hand with the flail. Later the depletion of soil and ravages of the midge, almost drove it from cultivation. Some few, however, have adhered to its culture and produced more or less every year. The high price of flour, combined with the stimulus given by State bounty, and a desire of our leading farmers to be independent of western wheat fields as much as possible, has led, recently, to a very great increase in the production of wheat. The midge has almost entirely disappeared—and the introduction of the "Lost Nation" wheat has been a God-send to this branch of farming.

Sufficient care is not exercised by our farmers in the selection and improvement of seed wheat. It is the universal practice to take the seed out of the bin, year after year, and the standard of its excellenee is thus yearly lowered instead of being improved, as would be the case if before harvest the best heads were selected out for seed, and a *breeding up by careful selection* practiced. This is a subject to which we would call particular attention, and a point we would forcibly impress. The farmers of Waldo county could double the value and product of their wheat in ten years, by strict, judicious attention to this one vital point.

Washing in brine, lye and lime water, prevails to some extent. The grain is usually dried by mixing with it air slaked lime, dry ashes, or plaster. Grass seed is often mixed in and thoroughly incorporated in the mass, and thus becomes sown with the wheat and saves time; it also can be sown more evenly by this method. Wheat is considered our best grain with which to sow down land to grass. Better catches are obtained than when grass seed is sown with oats or barley. One reason is that wheat is never sown on *poor* land; another is that it admits the sunshine and circulation of air about its stalks that other grains exclude to

greater extent. Wheat and corn necessitate high fertilization of the soil and clean culture; hence, with them we generally have good farming. The straw of wheat fed with shorts obtained from the grain, equals in nutritive value the hay that the same ground would have produced, leaving the flour obtained as a profit to the husbandman.

The tide is strongly setting in favor of home production of bread stuffs in Waldo county. It is an indication of reform in farm practice, and a healthy symptom. In order to show the practical workings of the increased attention to wheat production, we will cite some examples of the past few years, and feel confident that no county can show a better record. But before passing to this part of our subject, we wish to drop the remark that without plenty of lime in the soil wheat culture will be a failure. Dr. Jackson says "all the soils between the Kennebec and the Penobscot need liming." With the generous, and practically inexhaustible deposits on our southern border, this liming can be cheaply done. The lime should be applied broadcast in a pulverized or slaked state. If slaked with a brine made by dissolving as much salt in the water as will saturate it, the compound will be all the more valuable agriculturally. This salt and lime mixture is a cheap fertilizer, and one easily applied to the wheat field. It should be applied previous to sowing. I extract from a letter written by Mr. Elijah Clements of Monroe: "Fifty-nine years ago my father sowed wheat for the first time on this farm, on burnt land. He invariably got good wheat on a burn, while clearing land. When he began to plow, he sowed his wheat on broke-up land, and one year while I was a boy, he raised one hundred and forty-four bushels of nice wheat. The smallest crop he ever raised was five bushels to the one sown. I have been working the farm for the last seven years, and I have sown four bushels of wheat yearly, and my smallest yield was eight bushels to the bushel sown. That time heels-over-head took place with my stacks of grain, in a south-easter, and wasted, I know not how much. That was the Java seed. I left that for the Scotch Fife, which was a good exchange. I swapped that for the 'Lost Nation,' and that gives me about twelve bushels to the one sown. Last spring I sowed four bushels on rather poor soil, and raised forty-six bushels of nice wheat, that Robert Mayo's mill makes into the best of flour, and from five bushels of wheat he fills me a barrel of flour, and leaves me quite a lot of No. 2 flour. One year with

another my wheat crop is as sure a crop as I can raise. If farmers would dress their land, and sow wheat, and let potatoes alone, they would improve their farms greatly."

We are going to have better times in the near future for farmers. Now is the time to prepare for it and help it along by judicious attention to wheat culture. Get the land ready; make it clean; have it gaining in fertility, so that it can be worked with reasonable prospect of producing a good crop.

There was havested in 1872, in the town of Troy, on the road leading from Dixmont Corner to Elias Seavey's, in three-fourths of a mile, including four farms, three hundred and sixty-five bushels of good wheat; average ninety-one and one-fouth bushels to each farm. C. Y. Kimball of Jackson, raised in 1872, from eight bushels sowing, ninety-eight bushels of as nice "Lost Nation" wheat as can be grown anywhere. Elisha Edwards of Jackson, raised from three and a half bushels sowing of the same variety, in 1872, seventy-three bushels of nice grain. Near Knox Station, in the towns of Thorndike and Knox, on five farms in 1872, over five hundred bushels of choice "Lost Nation" wheat were produced. This was all in one neighborhood and embraced in less than one square mile of territory. The farms were those of Mr. Gardner, Darius Philbrick, Mark Shibles, Albert Palmer, and Herbert Ratcliffe. In Brooks, Mr. Ashael Rich raised on one and three-fourths acres of land, in 1872, fifty-three bushels of the same variety of wheat; Mr. W. N. Crosby, raised on two and three-fourths acres from four bushels sowing, seventy-five bushels. From these examples it looks as though Waldo county might, with a little effort, raise her own bread and thus avoid going out West to mill.

Indian Corn.

This noble grain, America's best indigenous plant, is grown to considerable extent in Waldo county. It is one of the signs of a good farmer when we see his corn cribs well filled. Corn is reckoned a sure crop though its production and success varies with different years. If planted from May 20th, to June 5th, there is little to apprehend, other things being equal, its doing well. From the 20th to the 25th of May is the better time experience has taught, for planting. Corn is planted on inverted sod and also on stubble land. It is not definitely settled which is preferable, though it is easier handling the crop on old land if

previous culture left it clean from weeds. The prevailing method of planting is to spread on from fifteen to twenty cart-loads of barn dressing per acre and harrow in well; then furrow out four feet apart and dress in hills with old yard manure, hay manure or superphosphate—the two latter being preferred. The manure is generally covered before dropping the seed. Often a crop of beans and pumpkins are planted with it. Hills are from three and a half to four feet apart. Various methods are adapted to scare away marauding crows, who often pull it up by the roots as soon as it breaks ground and thereafter till its roots resist their efforts. Stakes placed about the margin of the piece, six feet high, with white twine stretched between them, and encircling the piece, is one of the prevailing cheapest and most effectual modes. Some put a handfull of unleached ashes about the hill when the corn is about three inches high, and previous to the first hoeing. This on most old field land where potatoes have been grown previously, proves a good investment. The cultivator is run between the rows previous to each hoeing, of which it generally receives two, and sometimes after haying the piece is gone over and the weeds hard pulled. They should be carried to the edge of the piece and placed in piles and burned when dry to destroy seeds.

Topping the stalks above the ear allowing the rest to stand some weeks later, formerly prevailed, but now is about obsolete. It is now regarded as unnecessary labor. The same time devoted to this will cut up the whole stalk, bundle it and place all in shooks where it cures well, safe from storms. Visions of old-fashioned huskings rise up as we view the rustling acres of corn, and of the huge pumpkin pies as we see their golden globes dotting the field. When the farmer's corn cribs are well filled he will have fat hogs, sleek cattle and laying hens. He wears a happy contented look and the world goes well with him then. But let the crop fail and all is changed.

One of the good effects of corn culture is that it necessitates heavy manuring. This paves the way for successful wheat raising and good grass crops. Wheat is usually sown on corn land as a succeeding crop. The culture of wheat and corn are not attended with the heavy and disagreeable labor consequent upon potatoe raising. But it is clean and neat in comparison. The "King Philip" or Brown corn, is raised to some extent, but is not quite early enough for our seasons, and hence gets nipped by frost frequently. The Eight-rowed Canada, improved by judicious

selection and crosses, proves the best we have. The "Dutton Corn" is also a good variety. By selecting from year to year the best and earliest ripened ears, and those of most excellence of growth and form, much improvement can be made and much direct profit experienced.

The growing of sweet corn for canning, in connection with dairying, the stalks forming a good feed for milch cows, could be profitably introduced now that we are embarking in cheese factories to considerable extent. It would lengthen out our stores of forage, enabling the keeping of more cows; the money received from sales of the corn would pay for the commercial fertilizers used and labor of culture. We regard this as a point worthy of thought from all dairymen. Corn always commands a good price, and not one-half of that consumed in Waldo county is raised within her borders, but is shipped from the West. If it pays to to buy it and feed it, certainly it ought to pay to raise it and save freight. More attention is given to corn culture as well as that of wheat, within the past ten years; and the long strings of ripe, golden corn at our fairs and in granaries, attest our ability to raise a superior quality of this grain.

Barley.

This grain is quite extensively grown, but not so much as ten years ago. Barley succeeded oats as a general grain crop, and is in turn giving place to wheat, which was displaced by oats. Farmers have learned that they can grow as many bushels of wheat per acre on the same land as they can of barley, and all know that wheat is the far more valuable crop. Barley is a grain that can be sown late with good results, and sometimes comes into good account in backward seasons. We have sown it late as June 24th and succeeded well. It appreciates good land, and bears high manuring as well as any crop we know. It is of little use to sow it on poor land, and it is considered poor grain with which to seed to grass. If grass-seed is sown with it the barley should be sown thin, else a failure to secure a "catch" will often be the result. As food for animals it seems well adapted to fattening swine, and gives good results when fed to milch cows, but should always be ground before feeding. It is poor feed for horses, and positively injurious to some; and while it makes but

an indifferently good bread when bolted and baked, it does well for a change. That is to change *from*. The villainous use to which most of the barley sold from the farm is put—converted into whiskey—is an argument against it production for sale by all who desire to see the streams of intemperance diminished. Its lesser value, as a feed, than wheat or corn, is another reason for supplanting it with them; while the straw is inferior to that of oats or wheat, or corn stalks for stock. We believe the breadth cultivated in barley is annually diminishing for sound reasons of unprofitableness, based upon experience. No crop should be grown that could be replaced by a better—at least not to any large extent. The kind cultivated most in Waldo county is the Canada two-rowed. In countries where the atmosphere is dry and hot we learn barley is largely used as feed for horses, as for instance, California, Nevada, Arabia, &c. But our climate does not admit of its use with impunity. We are glad to state that it is gradually becoming superseded by wheat and corn—the two best grains known.

Oats.

This grain was formerly raised in great abundance, and is still considerably grown. It is a rank feeder, and rapidly exhausts lands upon which it grows, and is poor grain with which to sow grass seed. These facts have engendered considerable prejudice against its culture. Oats should never be put on poor land. They should receive special fertilization, and will repay attention as well as any crop grown. Nothing else seems so specially adapted to colts, horses, calves, sheep, and most kinds of stock,—especially horses. Nothing will make a "horse laugh" like a dish of plump oats. They are both hay and grain; their hulls acting as wadding while the kernel is full of the best nutriment. They do not lay heavy in the stomach, sour, or cause the ill effects corn, barley or wheat sometimes do when eaten too freely by animals.

It is necessary to sow oats early, and they are not injured by the spring frosts. Seed should be renewed from a northern, rather than a southern section. The oats that do best with us are those brought from Aroostook or Canada. Oats are generally sown on newly broken sod, but sometimes on old or stubble land. They luxuriate in deep, rich soil, or well manured uplands.

Rye and Buckwheat

Are not extensively grown. On burnt land rye used to be a very profitable crop, and was considerably sown. It does well on plowed land if well enriched, and properly sown. The winter variety succeeds best in this county. On the new farms of half a century ago, "rye and indian" formed the chief staple of bread, and when made half and half, and baked in a brick or "Dutch oven," formed a truly healthy, hearty and luxurious article of food to the hard working farmer.

Buckwheat is grown to some extent, and does well upon plowed lands. When ground it furnishes flour that makes a good food, either in the shape of "hot cakes or flap-jacks," which, when eaten with maple syrup, form a dish fit for anybody, from a king up to the farmer. There are two kinds of buckwheat, known as "rough" and "smooth." The "rough" is also known by the name of "India," or "Indian wheat," and is the greater yielder. From twenty to forty bushels could be raised on ordinary land, and with manuring might be increased to double that amount. It formed a good feed for hens, and when ground for fattening swine. Fifteen pounds of bolted flour per bushel is the average amount it yields. The hulls, separated in grinding, make a nice bedding for swine or horses.

It should be cut and raked into small wind-rows immediately, when the outer kernels have turned black. Care must be had in handling as it shatters out easily. As soon as wilted it should be put into small heaps, the size of an inverted bushel basket, and left out till it becomes dried through. We have seen it left out till snow came without being greatly injured. Some dry day, carefully turn over the heap, by putting a fork underneath, so that the bottom may air and dry. The rack in which it is hauled should have a tight bottom, or cloth spread over it. When pitched on carefully and not trodden, but little will be lost, if care is exercised. It is usually threshed by hand, and beats out very easily. One man may easily thresh fifty bushels a day. The straw is eaten by horses and cattle, but is better used as a bedding. If ten or fifteen ox-cart loads of manure is applied broadcast and harrowed in, we have no land so poor as not to give a fair crop of this grain. It forms, next after clover, one of the best crops for green manuring or plowing under; two crops per year may easily be applied to land, if desired. It is the more easily and quickly grown of the two. Plaster acts beneficially upon buckwheat; also lime and

ashes. It can be sown any time up to July 15th, with good prospect of ripening, and many prefer to sow it late rather than early. It deserves more attention than is at present accorded it.

Stock.

Neat Cattle.—There can be no good farming without stock. It is one of the indispensables. Yet there is a great deal of farming without *good* stock. Our animals are the machines with which we convert our bulky products of vegetable growth into milk, beef, wool and mutton; and with which we do our labor. If that machine is poor, runs with too much friction, yields a poor manufactured product, we are at a loss. It costs no more to keep good stock and keep it well, than poor stock and keep it poor; growing poor ourselves by the operation as compared with the profits to the good keeping of the choice stock.

The stock of Waldo county, especially its horned cattle, may be called "grades;" but of what, it would puzzle the most astute lawyer of Philadelphia, or any other man to tell. From time to time there has been an infusion of thoroughbred blood, but this has quickly lost its force and markings, though it crops out now and then in unmistakable points. Durham, Hereford, Devon, Jersey and Dutch, with others, perhaps, have been more or less mingled together and modified the stock of old "native" cattle that the early settlers introduced.

Col. Thorndike's importation of Durhams, one of which was sent to the "Great farm" in Jackson, first brought this blood into notice and repute among our farmers. While many soon turned against it, some few preserved it, and we see representatives of that strain on the farms of P. W. Ayer, Freedom, Isaac Coffin, Thorndike, as well as elsewhere. "Damon 3d," bought by David Sears, and put on his farm at Sears' Island, near Searsport, about 1860, was obtained from Obadiah Whittier of Vienna, in this State. Mr. Whittier bought him in New York. It is not known to a certainty that "Damon 3d" was full thoroughbred, but it is presumed he was, He has left a strain of stock that has been carefully preserved by some of our best farmers.

Recently, Mr. Ayer of Freedom, has brought into the county two thoroughbred Durham shorthorns of undoubted purity of blood, and is breeding from them some good stock. The blood from this source is also rapidly diffusing itself over the county.

His bull, three years old, "Knight of Geneva," is a fine specimen of the breed, and the cow "Flora" also maintains well its reputation.

From time to time, by various means, other strains of blood have been brought into the county. Mr. Burrill of Waldo, has a yearling Dutch bull, not a full blood, we believe, but a high grade. We have seen some of his calves lately which show his markings and points very well. Mr. Ellis of Northport, has several full blood Jerseys; his bull, "Butter Boy," is a fine specimen. At our County Fair, two years ago, thirteen head of Jerseys were exhibited, beside a large number of grade Jerseys. The Hereford exists only in grades. We think there are no Ayrshires at present except a bull owned by Hon. A. G. Jewett of Belfast.

Among our cattle are found some of the most excellent milkers, good workers, and fine beef animals. But there is no predicting where the strain will end, or what will crop out any time from such a mixed up stock as our old "native" cattle are. There is a desire to improve our stock and a growing faith in the thoroughbreds for breeding purposes. Now that cheese factories have been started among us, dairy animals, especially those noted as large producers of milk, will be sought after. Here we must lay aside Jerseys, except for butter-making, and take the Ayrshire, Dutch or some other breed. We are of the opinion that a cross of the Ayrshire upon our best milking "native" strain will be found about what is wanted.

Horses—We have in large numbers. Most farm labor is now done by them, and on those farms that have been smoothed down they accomplish more work at less expense than oxen. They are in demand from the beginning to the close of the year. They plow, harrow, cultivate, mow, rake, draw in and thresh. They take the crops to market, and bring home the groceries bought in exchange. They take us to church, school and circus, and in short are indispensable.

The breeds are as numerous as the catalogue. Too many light horses are bred, and this comes of too much straining to get a "fast" horse. This when attained, when the "trotter" has after years of waiting and watching been secured, when out of the thousand this *one* appears, it proves the ruination of the unlucky man who owns him, unless he sells out quickly. If more attention were paid to breeding draft and farm horses, we are of the

opinion it would result more profitably to the masses. Good heavy work horses are always in demand, and sell at good prices. There is less risk run in beeding them than the smaller and faster breeds, and they are more useful as a whole. We well know there must always be a class of driving horses, but this is only a portion needed. There must be work horses to help produce before there are needed pleasure horses to drive. Lately there has been brought into our county stallions of the larger draft breeds, and we think the quality of our horses are soon to show an improvement through these sources. Horses are, just now, more largely kept, in proportion, than any other stock. We think however their numbers are on the decline somewhat while those of other animals are gaining.

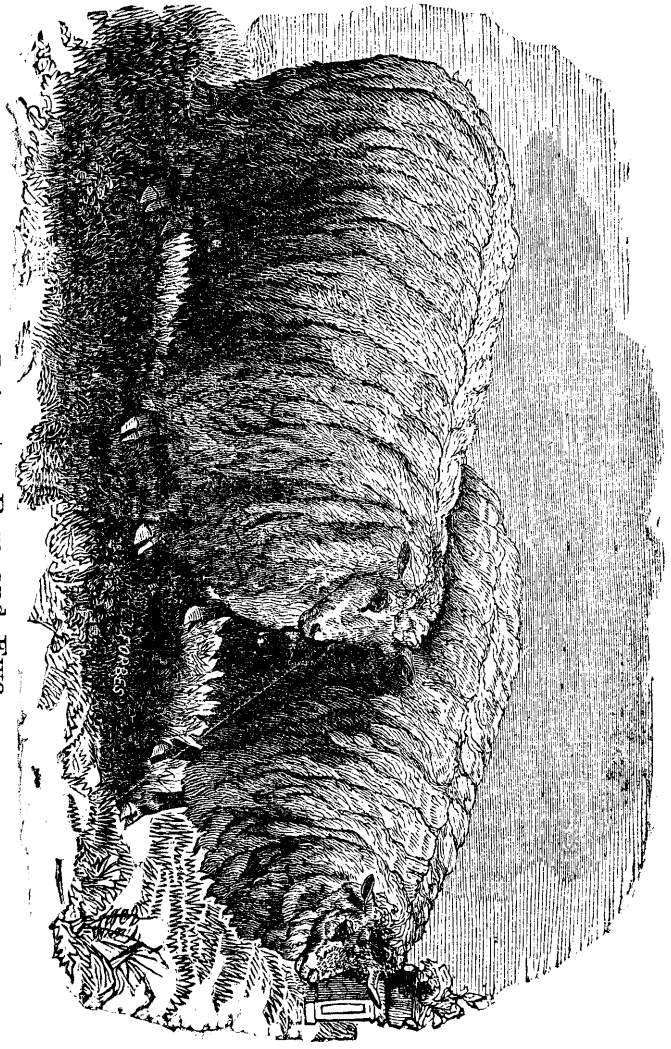
Sheep are our corner-stone of good husbandry, as they are elsewhere. Our flocks find the best of pasturage on our high lands and hills. There the sweet nutritious grasses on which they thrive, abound.

There are, here and there, a few pure bloods of several of the leading breeds; Cotswolds, Liecester, South and Oxford Downs, and Merinos. But the bulk of the sheep are grades and low down at that. The high price of wool during the war operated to largely increase the flocks. But since then there has been an ebb that has carried our flocks as far the other way. They are now increasing slowly in numbers, but are found only in small flocks except in rare instances. Many farmers have none at all, many only six, eight or ten. There are but few flocks of one hundred in the county. The town of Brooks, for example, by the assessors' books, shows only 865 sheep for 1873. There ought and might easily be kept five times that number. This is about a fair average of the state of sheep husbandry in Waldo county. That animal which is said to be "golden footed" which pays three times per year—wool, lambs and *pelt!*—is not receiving the attention that it is for the interest of the farmers to give it.

Mutton must be the first quality in the breed of sheep kept in our county; wool secondary,—and the breed that combines the two in greatest perfection is the breed for us to keep.

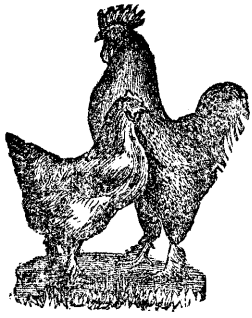
Were the hay and grain sold, now kept at home for consumption on the farm, Waldo county might very largely increase her flocks and herds, and *afford* to have some better animals than are now found in most towns. This may not be true of our whole

seaboard as a State, but we know it to be true of this county. It does not pay to raise small poor stock of any kind. The sooner our farmers fully adopt this maxim the sooner they will be on the road to profit and wealth. They had better pay high prices for good than accept the poor as a gift, for there is loss, not only of profit, but of food consumed and time spent attending them.



Leicester Ram and Ewe.

Domestic Fowl, Bees, &c.



In this branch of agricultural industry, Waldo county is not above the average. The great bulk of our fowls are grades of almost all known breeds. Our enterprising friend, Mr. Fred. Atwood of Winterport, and a few others, are introducing pure blood fowls of several leading varieties, and we expect to see good improvement result to this interest, thereby.

The egg trade is immense. Thousands of dozens are shipped to Boston every year by every country store; and during the autumn large lots of poultry are gathered up and sent to the same market. The keeping of fowls for poultry has not been practiced to any large extent or been universal. It is rather a secondary matter so far as hens are concerned—eggs being the first and leading object, and the best paying. Poultry, hitherto, has not brought the raiser per pound, prices that left much margin for profit, if we except occasional years. Turkeys are raised with profit by many of our good farmers and their wives. Geese and ducks are not largely kept. From diligent inquiry and observation, we are satisfied a flock of good hens properly cared for, will pay a net profit of one dollar per head, per annum.

Bees suffered greatly the season of 1871, there being few flowers, and followed by a severe winter. Three-fourths of the bees of Waldo county have perished since 1870. Probably no branch of our agriculture pays better in proportionate to the outlay than the keeping of bees. We could refer to instances of great profit, but these are always where proper care is bestowed. Hardly any of our farmers who keep bees prepare any pasture for them. They are left, too often, to themselves, to find food where it may chance to be and little thought or care is bestowed on them; except at swarming time and then this is clumsily done. Buckwheat, alsike clover, and other honey plants are easy of cultivation, and pastures for the bees might be sown at convenient places, with profit to the owner. The strong, full colony is the one that survives, and the one that pays.

PART SECOND.

Fences.

We build fences for two objects: first, to keep cattle in; second, to keep them out. Our highways are not public pasturage ground, and we are glad to know that the custom that obtained quite extensively years ago of pasturing highways, is almost obsolete. The custom was founded in error and wrong. It has had the tendency to make road fencing a common practice, and this still is in force in nearly every part of the county.

We have all sorts of fences—good, bad and indifferent—and made of various materials, and in various styles. Stone wall is largely in excess in some localities, both single and double. It is a convenient way to dispose of the surplus rocks, and a good double wall will last the longest of any fence we construct. Though costly, it is permanent. It is too common a sight to see long ricks of rocks tumbled up where it was convenient at the time to leave them, and where, perhaps, it is designed "at some convenient season" to build a wall. They not only encumber much ground, but harbor bushes, weeds, and vermin, all of which are injurious to the farmer's interests. It is also too common a sight to see fields dotted up with stone heaps, small and near together, with now and then a big stack, the accumulation of years from adjoining grounds. Instead of cumbering the surface with their unsightly presence, how much benefit they might confer if put into underdrains, the only proper place for cobble stones on the farm.

Wall makes a good fence for all kinds of stock except sheep; it can be made "sheep proof" by proper top-poling or by being built to sufficient height. Wall is the most expensive farm fence we have, in construction, and it is a rare sight to see it where it has been properly built. Poor wall, that is continually toppling over and which has to be rebuilt occasionally, is poor fencing. Wall, properly built, ought to be good for centuries; and only such will it pay to construct.

Our fencing ought to be wholly confined to our pastures. If this was done, we should have only one-half or less that we now

have, and consequently with the same outlay could have much better. Field fences, and road fences against fields, only have two uses, and these uses are damaging to the farmer's best interest. The first is, they enable him to feed his fields, spring and fall. The second is, they cause drifted roads, which causes him unnecessary labor and taxation, as well as poor roads. The cost of useless fences is a great argument for abolishing them. If the extra expense of their construction, together with cost of breaking roads in winter were saved, it would stop a great leak in farm economy. In the whole United States, it would soon pay the national debt.

Cedar fence, constructed with foot-pieces for holding stakes and a cap through which the stakes project, and under the top rail, is one of the best of fences, and is largely predominant in the towns of Unity, Troy, Thorndike and some others. This fence, well built of good material is good for a life time. Post and board fence is largely built in some sections. On land naturally dry where frost will not heave the posts out too rapidly, this is a profitable fence where good cedar, ash, or hacmetac posts are used.

On the seaboard a wire fence is coming into use, is cheaply built and proves very satisfactory. Posts are set ten feet apart and No. 9 wire fastened to them a foot apart, by staples made of the same wire, driven into the post clasping the wire. This fence, of all others, has the merit of not causing snow to drift, and is very appropriate and pretty for road fencing, where it is necessary to fence on the road. For sheep the lower wires may be placed nearer together than a foot while the upper ones may be farther apart. It is getting to be a serious question on many farms how to maintain the usual number and variety of fences, as materials are getting scarce. The true way is to abolish all but pasture fences and make those better. Road fences have bred up isolation and exclusiveness among farmers. "What is fenced in is mine, what is outside *is* outside." This has grown up part and parcel of themselves, and tends to bar out improvements. Like the soldiers behind breastworks, too often the farmer behind isolated exclusiveness defies all attacks, and views every approach with distrust.

Hedges have not come into use in this county except in a few localities, for wind-breaks, and near villages for ornament. Good fences upon the farm, and neat, tasty fences about the buildings,

are signs of practical economy and thrift. They indicate a thriving, enterprising, energetic man at the helm of affairs. It is a duty to state that one may see in passing over the county, miles of poor fences without a relieving good length,—brush fences, decayed log and pole fences, and all the other kinds nondescript, uncomely and costly by reason of ineffectiveness, and constant outlay for repairs. These fences are the nurseries of breachy and unruly cattle, where they receive a thorough education.

Farm Buildings.

In the matter of farm buildings, Waldo county will be found fully up to the average of her sister counties in good, commodious, even tasteful farm buildings. It is true there is no uniformity, for in a ride of a few miles all classes will be seen, from the humble one-story cottage, ancient and moss-grown perhaps, to the modern villa with its neat, prim air, and pert out-buildings. As elsewhere no section presents an unbroken average of good buildings, but certain districts average nearer equality in this respect than others. No log houses are seen, the remnants of the olden days of forest clearings, but the next class of dwellings which in turn followed them—low, wide, and roomy, with narrow, low windows and massive roofs, through which protrudes the giant chimney which takes up nearly half of the inside room below and which have sheltered more than one generation under their ample roof trees—are yet seen here and there.

Our farm-houses are too often planned after those of our city relatives, and thus are found inconvenient and expensive, while the general adaptability was overlooked, and comfort driven out. Too many content themselves to live cooped up in the ell, while the main house is used only for company and sleeping purposes. The ell usually occupies some back position, where pleasant views are cut off, and sunshine and light excluded by the overreaching expanse of the main structure. We often find the parlor—opened but little oftener than the family tomb—occupying the best position in the house, shut up and darkened to exclude dust and flies, chilly with loneliness, stiff and starched in its scrupulous neatness, and as useless towards giving comfort as the opposite side of the moon. Why, sensible people on other subjects, will follow this absurb practice, is inexplicable. Why they will scrimp and scrape and furnish a room in princely elegance to be kept as the

holy of holies, and sink hundreds of dollars in its furnishing, is incomprehensible. Why not fit up a jolly good sitting-room, whose walls shall hang thick with maps and pictures, and whose shelves shall bear treasures of books and papers, where comfort, solid, genuine, free and every day, may be enjoyed? Away with your sepulchral *parlors;* live in a common sense manner, and be happy.

As necessary to every farm-house as a situation, is the first great room of all—the kitchen. Here is the general culinary workshop, and here the good housewife must spend a large portion of her time. It should be the first room planned in the erection of a house, and should command as extensive a view as possible. It should be no gloomy den,—no dark corner,—but the sun of heaven should send its cheering light full into it and around it. The fields should be in sight with their carpet of green and waving crops; the outlook should be such that it reflects no pain to the sensitive soul. The kitchen should be fitted up with every labor-saving appliance and step-saving arrangement possible. It is too often the reverse, and the small cost of such conveniences are too often grudgingly withheld.

The plan of having the buildings connected is a good one in everything except in case of fire. But the risk is so small in this particular, that it fails to have weight. Convenience, protection from wind and storms, all go to help the arguments for connection. As necessary to comfort and profit, good out-buildings for hogs, hens and the storage of farm tools, carriages and fuel, are needed, though it is better to have as many under one roof as is practicable and convenient. The large extent of roofing on many farm buildings, is an item of serious expense. The less roofing we have that will cover the room we need the better. Better to gain room by height than by breadth in a country like ours, where buildings properly made and kept in repair, seldom or never blow down. We have very many good barns. The good barn is one evidence of a good farm and farmer; and it was a truthful remark of one of our rising young farmers: "A man is known by his barn." It has more truth than poetry, and well might pass into an adage. The barns of Mr. Palmer, and Mr. Coffin of Thorndike, Mr. Forbes and Mr. Reynolds of Brooks, Mr. Atwood and Mr. Cates of Munroe, Mr. Ayer and Mr. Sibley of Freedom, Mr. Foss of Jackson, may serve as models for imitation, and are especially worthy of

mention. These and others will be spoken of more fully under a subsequent head of this report.

We cannot leave this subject without speaking against the too common practice of letting the hens run loose about the barn, having no well defined quarters. They should be provided with suitable room and kept there as a home. A range of the barn and grounds about the buildings should be allowed days when proper, but they should come to their proper place for roosting and feeding and laying. If the proper precautions are taken to save and utilize their droppings their profit in this direction will be considerable, as no fertilizer made about the farm, or away from it, except night-soil, equals it in value. But in very many instances both are wasted—or even worse than that—allowed to be a nuisance and source of contagion. The privy should be so arranged that its contents will go into the manure cellar and be incorporated with other dressing, or weekly—or better—daily, mixed with absorbents, such as dry earth, muck, plaster and charcoal.

A word of caution to those contemplating the erection of farm buildings—never imitate, if you can plan out what you want. Build for convenience and comfort first, then work in the ornamental; build of only good materials, in a good location, and upon a solid foundation. Attention to these points would save thousands of dollars annually to each town. The first cost may be a little greater, but repairs will ever be smaller. Paint pays good interest in more ways than one.

Dairying.

Waldo county has facilities for this branch of agricultural industry surpassed by no other county in the State. Good grazing lands,—a good diversity of soil, plenty of timber and fencing materials,—a rolling, or hilly surface, with rich valleys and pure, abundant water, warrant us in making this statement. Yet private dairying, except in a few instances, has never attained a high degree of excellence. The easy and quick transportation enjoyed, and the markets opened, both home and foreign, point to the advantages dairying would have. Cheese has been manufactured by many farmers' households for their own consumption—more formerly than now, owing to the scarcity of female labor on the farm—and butter has, and now is, manufactured to considerable

extent for the markets; hardly any of it, however, attaining to the "gilt-edged" standard. Private dairying, owing to causes that are hard to remedy at present, among which is scarcity of farm labor, both for the house and the field, cannot largely increase. This is an accepted fact by our farmers, and has led to the introduction of associated dairying, which gives promise of gradual increase, and of working great good to the farming community.

It may be interesting, however, before we leave private dairying, to give a statement of one of our leading farmers, Mr. R. W. Ellis of Northport, regarding winter butter-making:

"I believe a majority of the farmers in this section think it will not, but I have long been convinced that it does not pay to let cows dry up in fall or early winter, and eat up the most, and in many cases, all the profit you get from them in summer. This winter, I have made an experiment to see whether there is an actual profit to be made in making butter in winter, and here is the result; it comes in the hardest part of the year, commencing the first of December. I have milked four cows, three Jerseys and one native; had two calves last spring and two last fall. They have had the best of care, kept in a warm stable where the manure has hardly frozen for the winter; their water warmed in the coldest of the weather, and care taken that they should drink twice every day. Their feed has been:

60 pounds hay per day at $25 per ton	$90 00
8 quarts corn meal per day, 80 cents per bushel	24 00
12 pounds shorts per day, 1¾ cents per pound	25 20
Total cost keeping four months	$139 20

They have made in the time:

425 pounds of butter, ⅔ of which sold at 40 cents per pound	$106 40
The other ⅓ at 35 cents per pound	55 65
Sold $2.75 worth of sour milk per week	49 00
Total receipts	$211 05
Less cost	139 20
Net profit	$71 85

This we have made, beside using all the new milk we needed in a family of seven, which was not less than one quart per day, and often much more, and giving considerable sour milk to a pig; in the first part of the winter keeping a pig wholly on milk which I did not have sale for.

One of the above cows, a Jersey, five years old last spring, calved one year ago the first of this month; calves again next

September; was kept by Rev. Gilbert Ellis of Belfast, last summer, and by myself this winter; has made in one year the amount ascertained, by trying her by herself one week in the middle of each month and averaging the month by it.

April,	12	quarts	milk	per day,	13	pounds	butter	per week....56
May,	13	"	"	"	14	"	"	" 62
June,	14	"	"	"	13	"	"	" 56
July,	12	"	"	"	12	"	"	" 53
August,	10	"	"	"	10	"	"	" 44
September,	9	"	"	"	10	"	"	" 43
October.	8	"	"	"	9	"	"	" 40
November,	7	"	"	"	8	"	"	" 34
December,	7	"	"	"	8	"	"	" 35
January,	6	"	"	"	7	"	"	" 31
February,	5	"	"	"	7	"	"	" 29
March,	5	"	"	"	7	"	"	" 31
								Total....514

Average quarts per day, 9; total in year, 3,825; average butter per week, little over 9 pounds 14 ounces; average quarts of milk to a pound of butter, 6½.

384 pounds of the butter has been sold for 40 cents per pound	$153 60
The other 130 pounds at 35 cents per pound	45 50
Reckon sour milk at 500 gallons, 12 cents per gallon	60 00
Total	$259 10
Cost of keeping for two months last spring, 20 pounds hay per day for 60 days.	12 00
2 quarts per day of barley, oats and corn meal, each 15 cents per day for 60 days	9 00
For pasturing 5 months in summer and an average of 1½ quarts meal per day	11 75
For 5 months this winter, 15 pounds hay per day, 1¼ per feed	28 12
3 pounds shorts per day for 150 days, 450	7 88
2 quarts corn meal per day	7 56
Total	$76 31
Income	$259 10
Expense	76 31
Profit	$182 79"

Mr. Ellis has quite a number of pure blood Jersey, and grades, which are well known to be an excellent butter breed.

Associated dairying was inaugurated in this county by an enterprising company of farmers in Northport, who organized in the summer of 1872, and made preparations for commencing operations in the spring of 1873. Up to this time, they have since the first of May been making cheese which finds ready sale in Belfast at fifteen cents per pound.

The factory at Monroe built and equipped this spring (1873,) is now in operation. There are organized companies at Searsmont,

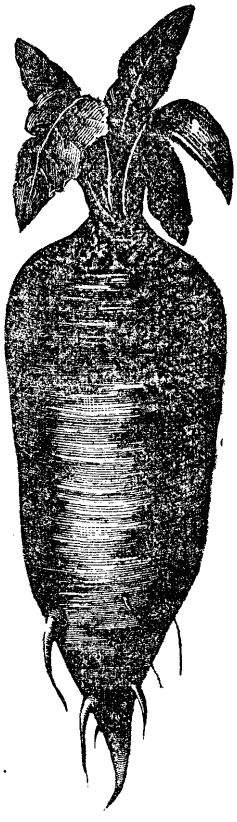
Montville and Brooks, that are erecting factories but have not as yet begun manufacture. Unity, Freedom, Jackson, Winterport, and other towns are talking up the advantages of associated dairying, and will, ere long we hope, be found among those that have begun manufacturing on the associated plan.

Among the obstacles to establishing these associated factories, are found the prejudice of some against "company business." They urge that the end will result as did the "Union stores," some few will secure all the profit and benefit at the cost of the others. The gathering in of the milk is another objection. There is also prejudice against capital in some instances, that is, that the stockholders get more than their proportional part. Also that the management of the factory may not be as it should. These and other objections obtain with many, and though of small weight, and very many of them groundless, militate against the establishing of factories. Many want their neighbors to go in and prove it to be a good thing, and then they will be willing to come in and share its benefits, without incuring risk at first, or bearing any burdens.

Among the benefits associated dairying will confer is first and foremost, taking the burden of the care of milk from the women, whose duties are now too multifarious and wearing. Second, it will enable the keeping of cows more largely than now, and be a means of consuming all the forage crops on the farm, at home; leaving increased manure heaps which means increased fertility. Having plenty of whey, hogs can be kept in greater numbers than now, and they in turn help increase the manure heap. With the increased manure, more wheat and corn can be grown for family use, and to better feed the cows and hogs. The sales of cheese will furnish ready money, and wheat and corn being largely raised will preclude the necessity of buying. Flour, corn, cheese, milk and pork being largely produced, ready money received monthly from sales of cheese, with farms yearly improving—are we wrong in saying associated dairying will work great good to the county? Now all this looks well on paper, and we call attention to it to prove that it is not, or is true. If true then, it befits us to work for its extension now that it is introduced. If it may be a means of so happily benefitting us, it is well that we speedily engage in it. It is beyond dispute that it has been successful wherever it has heretofore prevailed since its first inauguration by Jessie Williams of Rome, N. Y.

The markets of the world are open to every good article of food. Cheese is no more perishable than flour, sugar, tea, coffee, or meat. These are shipped around the world—their surplus going to any and every quarter where there is deficiency, and consequently a good demand. Dairying must always be confined to comparatively limited areas for obvious reasons of climate and soil suitable to its wants. Hence, taking this broad, true and comprehensive view, we may be sure that over-production of cheese is as much a myth, as the over-production of wheat, corn, or sugar.

Root Culture



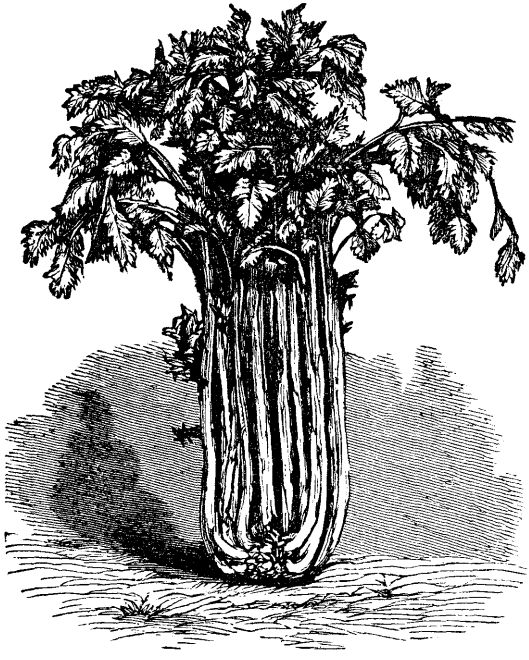
Is not pursued to that extent it is in some of the western counties, but considerable quantities are annually raised by thrifty farmers in each town. The culture of roots for feeding purposes is not at all general, nor does it obtain as it should. We think the practice of selling hay and keeping small numbers of cattle tends to this result. With better farm practices, more attention to stock raising and dairying, their culture will become more general. No better crop can be grown, nor will expense laid out be more fully returned than that bestowed upon the growth of carrots, beets and turnips, for feeding purposes. Almost every farmer has some apology for a garden, though candor compels us to say there are some who make no attempt, and their farming is usually of that style not to be followed after; but only the few, as yet, make the growing of roots for feeding their stock, part and parcel of their husbandry.

We wish to call the attention of our farmers to the great value and productiveness of "Lane's Improved Imperial Sugar Beet," an illustration of which is herewith given.* We have raised and fed this beet with the most satisfactory results. It is specially adapted as a feeding root for

* We are indebted to Messrs. B. K. Bliss & Co., Seedsmen, 23 Park Place, N. Y., for the accompanying illustration.

milch cows, and we have no hesitation in commending it to our dairymen. It yields in good soil, when planted early, enormous crops. Its history is as follows: In 1858, Mr. Henry Lane of Cornwall, Vt., received from Washington three varieties of sugar beets. They were carefully grown, and the variety called "Imperial Sugar Beet" was found to be much superior to the others, and to any other beet that had been seen in the region. It at once supplanted all other varieties in use among his neighbors, and it has been so much improved by Mr. Lane that he claims that it yields "with greater certainty, a greater amount of food per acre than any other root, at less cost, of better quality than the turnip, nearly as good as the carrot for young stock, and better for milk; ready to feed by the first or middle of October, and keeping sound through the winter until late in the spring."

No part of the farm pays better or is productive of more pleasure as well as profit, than the garden. It is incumbent upon every farmer to provide a well-stocked garden for the luxury and health it contributes to his family. If well managed, it is a source of profit that contributes toward a good living to a great extent, compared with its cost. Who would be without sweet corn, green peas and beans, for the little care they require, or cucumbers, melons, onions, strawberries, raspberries, blueberries, turnips, and so on to the end of the list of garden possibilities? It would seem to be a deprivation none would forego voluntarily.



CELERY.—Boston Market.

We may be aiding those of less experience, and perhaps help forward gardening in the places where it is now neglected, by giving a short and

plain description of the hot-bed and also of the cold frame. If there is need of fostering and encouraging any one thing, it is gardening; and the hot-bed lies properly at the very foundation or starting point of a good garden.

"Sow in heat—Sow in a hot-bed," are directions so commonly to be found that we feel we shall be materially aiding those who are their own gardeners if we give a few simple directions on the subject of a hot-bed, composed of stable manure, the most frequent and useful form in which it is to be found.

The preparation of the dung is a matter of great importance, and if the bed be expected to retain its usefulness for any length of time, it should be well worked previous to being used. If obtained fresh from the stable-yard, and found to be too dry, it should be well watered and thrown lightly together to ferment; this will take place in the course of a few days, and three or four days afterwards it should be completely turned, well shaken and mixed, keeping the more littery portion to the interior of the heap; a second turning and watering may be necessary, although one will be generally found to be sufficient; when thus cleaned of its rankness the *bed* may be made.

The situation for this should be dry underneath, sheltered from the north as much as possible and fully exposed to the sun; it should be built up from two feet six inches to four feet high, and wider by six inches every way than the frame to be placed upon it. The dung should be well shaken and mixed while being put together, and firmly pressed by the feet. The frame should be kept close until the heat rises, and three or four inches of sifted sand or ashes should be placed on the surface of the bed; in a few days it will be ready for use; but air should be given night and day while there is any danger from the rank steam, and if the sand or ashes are drawn away from the side of the bed, they should be replaced.

When the hot-bed is used for seeds only, nothing further is necessary; they are to be sown in pots or pans, placed or plunged in the bed, the heat of which will soon cause them to germinate. As this will, after some time, decline, what are called linings should be added—that is, fresh, hot, fermenting (but not rank) dung applied about a foot in width all round the bed; this renews its strength, and will greatly aid its successful management.

A cold frame is formed by placing the ordinary hot-bed frame

upon a bed of light, rich soil in some place in the garden where it will be protected from cold winds. They should both be shaded from the sun by mats during the middle of the day.

Potatoes.

It would be interesting if we could give the exact statistics regarding the sale and export of potatoes from our county. It would not only be interesting, but also alarming, to see what quantities of potash—that costly ingredient of our soils, and which it costs so much to restore—we are annually drawing forth.

We regard potatoes as an exhausting crop for our soils, and as generally managed, perhaps the most so of any we cultivate. With us potatoes constitute an important article of sale, being shipped to Boston and all along the coast west and south. Maine produces first quality of potatoes, and they are eagerly sought for seed purposes in Massachusetts and the west. Dr. Loring says: "I would always renew my seed potatoes from Maine;" a compliment from a high source.

The favorites most cultivated in our county are the Orono, the Early Rose, the Davis Seedling and the Harrison. The Orono is our great market potato, yields well, is a superior table potato, keeps well and is not specially affected by rot. No potato yet introduced stands so well as the Orono with us. It is medium for earliness, white, has medium top and is prolific in blossoms and seed balls, eyes sunk, flattened, oblong and handsome.

The Early Rose we regard only of utility as an early potato; does not hold its good qualities till spring, with us.

The Early White or Blue, is also used for early use, also the Early Sebec. Both of these are excellent varieties for the table, keep well and retain their good qualities. The White is a small yielder, but the Sebec is very prolific—more so than the Rose, and about the same as the Orono.

The Harrison is a smooth oval white potato, the whitest variety we know, yields well, and of good table qualities generally, has a very small top, seldom flowers late, and is medium for earliness; should not be grown on clayey land.

The Davis Seedling is a bright red potato, very attractive in appearance, round, medium set eyes, large top and yields largely. It is an excellent late winter and spring potato and profitable

to grow for stock. This is the highest colored potato with which we are acquainted. We have grown it for several years.

The California Red and White are largely grown for feeding. We prefer the White variety, it is a larger yielder and a handsomer potato than the red mottled. The rust never affects the California, but some years it dry rots in the cellar after storing.

The Shaker Russet is a prolific potato, yielding immense crops, but is fit only for feeding purposes; it somewhat resembles the Garnet Chili, but is a better yielder.

We are pleased to record the decrease in breadth planted in potatoes this year and the corresponding increase in the acres of wheat. Potato culture, from the time the seed is taken from the cellar, is hard, dirty, disagreeable and laborious. It has but few redeeming features. It rapidly exhausts land unless highly manured, which militates against their soundness, as thousands and thousands of acres in Waldo county bear solemn witness. We believe the true policy is never to sell off any potatoes and raise only enough for use on the farm. Other crops can be grown that require less labor, at greater profit; and we should look to other sources for a market product, than to the potato field.

Manures.

Barn manure is the leading kind used, but with all the great needs for saving all its value and quantity, our farmers, as a class, are too careless in so doing. Only now and then one provides any shelter for it, and still less uses bedding or absorbents for animals regularly. Under most of the new barns built within ten years, and also under the better class of old barns, are generally cellars for saving manure. Hogs are usually employed to "fork this over," being encouraged by their natural propensity to "root," and a few grains of corn scattered amongst it. Horse manure strewn under cattle serves to make a bedding, is somewhat of an absorbent, and helps "fine" the dung. It also prevents itself becoming fine-fanged.

"Manures," says Prof. Wm. H. Bruckner in his *American Manures*, "are substances added or applied to soils, to supply the wants of the different plants intended for the use of man and animals. That certain vegetable, animal and mineral substances, applied to soils, will quicken the growth of vegetation and increase the amount of production, are facts that have been known

from the earliest period. But the nature and properties of these substances, called manures; the manner in which they act; the best modes of applying them; and their relative value and durability, are subjects still open to inquiry."

The method of application which obtains with a portion of the farmers of Waldo county, is to harrow in on the furrow. Another portion plow in shallow, plowing deeper the succeeding year to throw up the manure plowed under, to the surface. It is not usual to apply manure in the hill, except old decomposed manure, in the garden, or for corn or early potatoes. It is generally conceded that manure loses by exposure and that it should be incorporated with the soil, in some form, to insure retention of its valuable ingredients. It is also the general experience that the time to apply manure as top-dressing to grass lands, is in the autumn. If the manure is decomposed and fine, the sooner after haying it is put on the better, provided the weather is not too dry.

Plaster is used to considerable extent on potatoes, corn, grain, and as top-dressing for grass lands. The usual time of application is, for grass, just as the snow is going off in the spring. For potatoes and corn, when they first appear above the ground; and for grain, it is sown broadcast at time of sowing grain, or when it is coming up. The best results obtained for grass are upon those pieces that are rough of bottom, or those full of "cradle-knolls," to use the common parlance. These unplowed lands are often made to produce luxuriant crops of hay by the application of from 100 to 300 pounds plaster per acre.

Plaster (sulphate of lime) or gypsum contains in every 100 lbs., 46.51 lbs. sulphuric acid, 32.56 lbs. lime, and 20.93 lbs. chemically combined water. Its benefit to soils and crops may be due to either sulphuric acid, or lime, as the wants may be. One hundred parts of plaster will absorb only one part of water in twelve hours, showing its small absorbent capacity. This is the limit of its absorbing capacity for moisture—1 in 100. Probably on most soils its fertilizing value lies in its sulphuric acid. With carbonate of ammonia it forms sulphate of ammonia. The low cost of plaster to the farmers of Waldo county induces a free use of it whenever found beneficial. It is usually from five to eight dollars per ton. Plaster is ground from the rock obtained in Nova Scotia. Mr. J. H. Kaler of Belfast, manufactures large amounts at his mill. The plaster ground at "Red Beech" mill in eastern Maine, near

Calais, is also shipped to our ports in large quantities. Plaster is a good absorbent of gases, and may be freely used in stables, privies, compost heaps, and scattered over manure piles frequently with good paying results. It forms one of the best ingredients to mix with the droppings of fowls. It may be used in equal parts and the compound thus formed is one of the best fertilizers for potatoes, common garden vegetables, &c., that can be made at the same cost.

Lime is found in abundance in the southern part of the county. Smaller deposits, suited for agricultural purposes are found in some of the interior towns. It is burned only in the towns of Islesboro', Lincolnville and Searsmont. Our soils generally, need liming, and this fortunately can be done cheaply.

Oxide of calcium, or quick-lime, is composed of twenty parts of calcium with eight parts of oxygen, these figures equaling one equivalent of each. Carbonate of lime, or limestone, is composed of oxide of calcium combined with carbonic acid. When pure, every 100 lbs. of limestone contain 44 lbs. of carbonic acid, and 56 lbs. of oxide of calcium; or when burnt, an equivalent amount of quick-lime. Limestones generally contain more or less impurities, such as silica, magnesium, alumina and oxide of iron—sometimes potash, and organic matter. When limestone is burned, the carbonic acid is expelled, and the lime is left in a caustic state, as quick-lime. Lime quickly absorbs water, generating heat, and swells over three times its bulk in slaking. When combined with water, or slaked, it becomes hydrate of lime, and consists of 75.68 lbs. of lime, 24.32 lbs. of water chemically combined. Lime should be slaked before applying to the soil.

The office of lime is to cause decomposition of vegetable matter in the soil, thereby fitting it for plant food; the liberation of nitrogen, as ammonia, from organic substances. As nitrogen is an element necessary to the healthy growth of grains and plants used as food, its value is very great. Lime also acts beneficially on the inorganic particles of soil, liberating their sulphur, potash, and soda, and rendering them light and friable if heavy, and more compact if loose and sandy. On soils where sorrel or pine trees grow spontaneously, lime is greatly needed, and such soils can seldom be cultivated beneficially and profitably without it. Lime should be applied as near the surface as possible. Broadcast on the surface is the best way as its action is greater when in contact with the air and moisture. Lime is a great stimulant to the soil.

Not less than forty to fifty bushels per acre should be applied. On heavy clay double this amount will be needed; this amount will be sufficient for several years.

Potash can be the cheapest supplied to soils in the form of wood ashes. Cultivated plants need more potash than those growing spontaneously. The value of ashes as a manure has been known and appreciated far back into dim antiquity. Both the leached and unleached ashes are valuable, the unleached much more so for most soils, as they contain more potash than the leached. At Green's Corner in Troy, are large potash works, and the farmers of the vicinity and neighboring towns use the leached ashes largely on their lands. They are also shipped in from Canada by way of the railroad. Ashes command about twenty cents per bushel when unleached. They are easily applied, either broadcast or in the hill. Many practice putting them about the young sprouts of corn when coming up; half a cup-full of unleached to the hill, previous to the first hoeing, being used. Ashes form a valuable top-dressing for upland grass fields, and may be spread in autumn to the best advantage.

Salt is not much used as a manure by the farmers of the county, if we except those who use it as contained in marine manures of the coast. There is no doubt of its good effects when used in the interior towns, as these are not so favored by salt breezes and sea air as the shore towns. Salt (chloride of sodium) contains in every 100 parts, 60.68 of chlorine and 39.32 of sodium. It has been used as a manure in all countries and ages, and there has been much controversey as to its value. It exists in most soils in small quantities. It assists in decomposing vegetable and animal matters present. In large quantities it is extremely injurious; land may be made completely sterile by applying it too largely. It acts as an exterminator of some kinds of insects in the soil, such as the wire worm, and has a tendency to prevent mildew and rust. It should not be applied at the rate of but two or three bushels per acre.

The following tables will be found useful and instructive, showing the comparative food value of plants, their component parts and their percentage of moisture. The component parts of manures, and the adaptibility of manure to crop, and crop to manure, Tables I, II, III, IV and V, are from "American Manures," by Wm. H. Bruckner, Ph. D.

TABLE I.—*Showing percentage of moisture, glutinous compounds, starch, gum, sugar, woody fibre, ash and nitrogen, of useful Plants.*

PLANT.	Moisture.	Albuminous and glutinous compounds.	Starch, gum, sugar and woody fibre.	Ash.	Total	Nitrogen.	Equivalent of ammonia.
Grass	48.60	2.6	47.74	2.20	100.00	0.33	0.40
Clover	16.00	8 12	68 38	7.50	100.00	1.30	1.58
Barley straw	10.94	1 80	82.12	5.14	100.00	0.35	0.42
Oat straw	8.25	2.15	84 50	5.10	100.00	0.39	0.47
Wheat straw	6.42	1.80	86.66	5.12	100.00	0 35	0 42
Corn stalks	10.20	1.08	83.22	5 50	100.00	0.24	0 29
Carrots	85.20	1.50	12.40	0.90	100.00	0 24	0 29
Turnips	90.43	1.35	7.72	0.50	100.00	0.21	0.25
Potatoes	75.00	2.20	21.90	0.90	100.00	0.35	0.42
Peas	10.80	23.40	62.70	3.10	100 00	3.74	4 54
Beans	8.75	22.81	65.04	3.40	100 00	3 65	4.43
Indian Corn	15 00	11.25	70 75	3 00	100.00	1.18	1.43
Rye	10.00	10.57	77 33	2 10	100 00	1.69	2.05
Oats	10.10	14.20	67.20	3.50	100.00	2.27	2.75
Barley	8.75	14 50	73 10	3 65	100.00	2.30	2 80
Wheat	8.55	19.50	69.10	2.85	100.00	2 32	2.81
Buckwheat	5.20	9.50	83.10	2.20	100.00	2.41	2.92
Cotton Seed cake	12.00	35.00	34.50	4.50	100.00	5.60	6.80

TABLE II.—*Showing the component value of Animal Excrements in* 1,000 *pounds.*

KIND.	Water.	Phos. Acid.	Potash.	Nitrogen.	Ammonia.
Hog manure	840	8.0	5 0	7.0	= 8.5
Horse "	743	12.2	28.0	5.4	= 6.5
Cow "	864	5.2	10.7	3.5	= 4.2
Chicken "	850	15.2	5.5	21.5	= 26.1
Sheep "	670	22.7	7.0	7.1	= 8.5
Human "	750	3.3	1.0	15.0	= 18.2

TABLE III.—*Showing the amount produced annually per Animal.*

	Amount.	Phos. Acid.	Potash.	Ammonia.	Value.
Hog	200	1.6	1.0	1.7	$0 62
Horse	2,000	24 4	56 0	1.30	9 94
Cow	2,000	10.4	21.0	18.5	5 15
Chicken	5	0.076	0.03	0.15	4
Sheep	50	1.27	0.35	0.42	40
Human	100	0.33	0.10	1.41	50

TABLE IV.—*Showing the value of urine of different Animals as determined by the value of salts contained in each.*

	Water.	Phos Acid.	Potash.	Nitrogen.	Ammonia.
Hog	9.29	trace	6.0	11.8	= 14.3
Horse	9.40	trace	2.8	15 4	= 18.7
Cow	9.23	trace	4 5	11.4	= 5.3
Sheep	9.65	1.3	7.2	13.1	= 15.9
Human	9.57	4.0	2.0	14.2	= 17.2

TABLE V —*Showing the value of urine produced annually by each Animal.*

	Amount.	Phos. Acid.	Potash.	Ammonia.	Value.
Hog	1,000 lbs.	trace	6.0	14.3	$4 00
Horse	2,000 "	trace	5.0	37.4	9 79
Cow	2,000 "	trace	9.0	8.8	2 92
Sheep	500 "	0.6	3.6	8.0	2 35
Human	750 "	3.0	1.5	10.7	3 16

TABLE VI.—*Showing the value of solid and liquid excrements of Animals, taken together, per year.*

Hog excrements, solid and liquid	$4 62
Horse " " "	19 73
Cow " " "	8 07
Sheep " " "	2 75
Human " " "	3 66

To show the draft on our soils for mineral elements of plant food, we give the following, which may be relied on as very nearly correct.

Twenty-five bushels of wheat per acre of 60 lbs. to the bushel, is a fair yield, and requires:

	Grain.	Straw.	Total.
Ammonia	41.71 lbs.	10.18 lbs.	51.89 lbs.
Phos. Acid	15.00 "	11.10 "	26.10 "
Sul. Acid	1.80 "	5.10 "	6.90 "
Lime	1.35 "	12.00 "	13.35 "
Magnesia	4.65 "	5.10 "	9.75 "
Potash	12.00 "	23.70 "	35.70 "

Indian Corn.—Fifty bushels of corn of 38 lbs. to the bushel, requires:

	Grain.	Stalk and Cob.	Total.
Ammonia	34.22 lbs.	6.00 lbs.	40.22 lbs.
Phos. Acid	25.81 "	13.50 "	39.31 "
Sul. Acid	2.90 "	8.40 "	11.30 "
Lime	0.87 "	17.70 "	18.57 "
Magnesia	7.83 "	9.30 "	17.13 "
Potash	15.08 "	59.70 "	74.78 "
Silica	2.32 "	81.60 "	83.92 "

Oats.—Fifty bushels per acre of 33 lbs. to the bushel, takes from the land, as follows:

	Grain.	Straw.	Total.
Ammonia	37.45 lbs.	7.80 lbs.	45.25 lbs.
Phos. Acid	10.39 "	4.00 "	14.59 "
Sul. Acid	6.62 "	3.20 "	9.82 "
Lime	1.81 "	7.40 "	9.21 "
Magnesia	3.47 "	3.80 "	7.27 "
Potash	7.59 "	6.00 "	13.59 "
Silica	2.14 "	45.40 "	47.54 "

Barley.—Thirty bushels of barley to the acre of 48 lbs. to the bushel, requires:

	Grain.	Straw.	Total.
Ammonia	33.40 lbs.	7.60 lbs.	41.00 lbs.
Phos. Acid	9.64 "	5.40 "	15.04 "
Sul. Acid	1.73 "	4.40 "	6.13 "
Lime	.72 "	8.80 "	9.52 "
Magnesia	2.44 "	2.80 "	5.24 "
Potash	6.33 "	25.80 "	32.13 "
Silica	7.63 "	68.80 "	76.43 "

Potatoes.—One hundred bushels of potatoes per acre of 60 lbs. per bushel, require:

	Tubers.	Tops.	Total.
Ammonia	21.00 lbs.	1.50 lbs.	22.50 lbs.
Phos. Acid	33.00 "	18.00 "	51.00 "
Sul. Acid	12.60 "	15.50 "	28.10 "
Lime	4.20 "	55.00 "	59.20 "
Magnesia	7.80 "	10.50 "	18.30 "
Potash	109.00 "	70.00 "	179.00 "
Silica	13.00 "	30.00 "	43.00 "

These are *taken out* of every soil where the above amount of crops are grown per acre.

Marine Manures.—Along the shore of the bay rock-weed abounds, and is gathered annually by the farmers, who use it in various ways. Some put it in yards for cattle to lie on, and tread it up with their droppings after which it is used for corn and potatoes. It is used as mulch about the apple trees, and the exemption from borers enjoyed by our shore orchardists, may be largely due to this mulching with rock weed. In some instances it is used as a top-dressing for grass lands, being spread on after haying.

"Muscle bed" is used to some extent as an ingredient for composts, and as top-dressing for grass lands. It is also put in yards to be incorporated with the droppings of cattle. It is a rich mud deposit found in shoal water, or left bare by tides, and is filled with marine shells and the remains of shell fish. It is readily obtained by use of flat-boats or scows, which are filled at low water and floated in shore on the rising tide. Sometimes the flats admit of driving upon them with teams to the muscle deposits.

"Porgy chum" is the residue left after expressing the oil from the fish, which have been steamed or boiled. This is usually composted with seaweed, muck, and soil, and some leave it in large mounds covered with earth, till the following season, when it is spread on grass land or put on land that is intended for cultivation with hoed or grain crops. This is a powerful nitrogenous manure, and gives good results when carefully applied, to almost all crops.

Lobster shells and waste is of the same nature as porgy chum, with the exception of containing more lime in its composition.

We are confident that the marine manures of our coast are not duly appreciated, or applied as much as they will be in years to come. The ocean casts up of its rich furnishings annually, to the shores, much that is of great fertilizing value. This will be more and more appreciated and utilized, as the necessities become yearly greater, supplying the soil with food for plants. By drying and pressing or grinding, porgy chum, rock-weed, and muscle-bed could be packed in close bulk and transported cheaply to the interior. But little has been done in this direction, so far, though we believe Mr. Kaler of Belfast, has initiated this branch of industry.

Forest Growth.

Originally Waldo county was covered with a magnificent growth of forest trees. The early pioneers found the pine, the hemlock, the spruce, fir, tamarack, beech, birch, maple, bass, and a variety of other timber growth in the greatest abundance. The pine, the monarch of our northern forests, was peculiarly at home. Oak and ash were largely worked up into staves and found a market at our seaports, from whence they were shipped to the southward. Towering in primitive grandeur there were the finest of timber trees, unculled by the lumberman, or undwarfed by contiguous clearings. There was indeed wood enough and to spare. How to get rid of it in order to clear the land for crops, was the grand problem. The trees must be cleared away before the corn would grow, and the forest removed before the field could be made. A superabundance induces reckless waste; so in the destruction of forest growth. The trees were felled and burned where they lay. Fires were encouraged to run in the woods in dry times, and every means taken to subdue the exuberant growth. Man is a destructive agent and fully distinguished himself in this and proved equal to the emergency, as the naked hill-tops and scattered fringes of wood attest.

On many farms the supply of wood is inadequate to the necessities. But few, comparatively, are well stocked. The general destruction of growth, the demands for timber and fuel, together with inattention to preserving sufficient breadth in woods, has left the country with a comparative short supply. It is sad to reflect that as yet, even with the facts of short supplies staring us in the face, and the general knowledge of the state of things, has not as yet started any general effort to preserve and prevent further waste of what we have left.

Shade trees beside roads and about buildings are beautiful and add much to the beauty, attractiveness and value of real estate so provided. We are glad to observe that there is a wide-spread appreciation of this, and that trees are annually set and cultivated in every locality. There is, in isolated instances, a strong effort put forth to preserve young growth and prune it and keep it in the best condition. There is also an inclination to let waste places and rocky, barren pastures grow up to bushes and woods. Perhaps this comes from an indifference on the part of the owners rather than from any direct desire, or from want of time to cut

them away, owing to the amount of surface elsewhere that takes time and attention of the occupant. English willows when planted, by means of cuttings, thickly beside roads, or division fences, form pretty screens, wind-breaks, and hedges. They are rapid growers and soon form an impenetrable barrier to stock, and can be cut every eight or ten years for wood, leaving stumps three feet high, which soon throw up vigorous sprouts again to form a new harvest of wood.

Poplar is a rapid grower, and forms a handsome shade tree. It is deserving of more attention, as such, than it generally receives. It bears transplanting well, and forms a round dense topped tree with close foliage, and its leaves, being delicately hung on fibrous stems, feel the slightest moving of air, and are constantly in motion. It is known as aspen tree in some localities. The abundance in which this tree occurs on gravelly soils, the sturdy habit it early assumes, the ease with which it can be removed and the absolute certainty of living if well transplanted, recommend it to general use as an ornamental tree.

The maple is a slow grower but forms a splendid shade tree when it attains growth enough to develope considerable spread of top. The elm is a hardy, graceful tree, and does best in a moist, alluvial soil. It is hardy, if care is taken in setting.

The evergreens—spruce, hemlock, arbor vitæ or cedar and fir—make desirable ornamental trees and their pyramidal form and dense foliage protect from bleak winds and keen air. They are found in abundance in old pastures and may be easily removed with nearly all their roots intact, and drawn on a sled or stone-drag with their mass of soil clinging to them, and set with small chance for loss, about orchards and on the north and west sides of houses, they form nice protecting screens if set thickly together. They should be at some distance from the house to allow good light and air. Pine and tamarack form desirable ornamental trees. They are more open of foliage than the others and consequently not so well adapted for hedges, but rather for separate growth. Sumac and mountain ash are very pretty foliaged trees; the former bears a red cone, the latter scarlet berries, which remain upon the tree till winter, making a pretty ornament above the dreary dun carpeted earth of late fall or the white snows of winter.

Not much of the original growth of the county remains. Here and there in secluded places, a few acres may be found where the old growth trees yet remain, but the greater portion of our forests

and woodlands are second, or younger growths. White oak does not appear but in one or two localities, but red oak is quite common. White birch abounds upon the seashore, or on the gravel ridges of the interior.

Attention to tree-planting must be had, together with a judicious preservation and cultivation of what growth we have, or the next generation must import all their building materials, and burn coal to a large extent. This is very apparent to the observer, and wood is one of the necessities of a climate like ours. We would not raise the idea that Waldo county is more destitute of wood than the other counties of central and seaboard Maine, but on the contrary, think from observation she is fully as well provided, if we except Washington county. But this attention to wood production, and the fact of its becoming scarcer gradually, is patent to all who have observed and given the matter attention.

Our bold hill-tops could be put to no better use than to re-clothe them with their original forest covering. We believe the climate of the county would be essentially modified by so doing; that bleak winds would not be so much felt, and drouths would prevail to a less extent. Forests have visible effect upon the health of any district. Where the growth is largely composed of balsamic trees it is free from fevers and lung complaints to an extent unknown to other districts. There should be always the proper balance of forest maintained, and this can be on lands of avail for no other agricultural purpose, and be made a source of profit, as well as health and pleasure.

List of Trees and Shrubs common to Waldo County.

NOTE. A collection of specimens embracing the following list, was made by the author while preparing this article, and afterward presented by him to the State College of Agriculture and the Mechanic Arts, Orono, where they may be seen in the cabinet of that Institution. It will be seen this list embraces only those kinds which are common to all parts of the county.—J. W. L.

Smooth Alder.....*Alnus serrulata.*
Black Alder.....*A. incana.*
Yellow Ash.....*Fraxinus viridis.*
Brown Ash.....*F. pubescens.*
Black Ash.....*F. sambucifolia.*
White Ash.....*F. Americana.*
Mountain Ash.....*Pyrus Americana.*

Apple Tree	*Pyrus Malus.*
Blackberry	*Rubus villosus.*
Blueberry	*Vaccinium Canadense.*
Red Beech	*Fagus sylvatica.*
White Beech	*F. Ferruginea.*
Yellow Birch	*Betula lutea.*
White Birch	*B. populifolia.*
Black Birch	*B. lenta.*
Balm of Gilead	*Populus candicans.*
Black Basswood	*Tilia Americana.*
White Basswood	*T. heterophylla.*
Cedar	*Thuja occidentalis.*
Wild Red Cherry	*Prunus Pennsylvanica.*
Black Cherry	*P. serotina.*
Choke Cherry	*P. Virginiana.*
Red Currant	*Ribes rubrum.*
Black Currant	*R. nigrum.*
Dogwood	*Cornus florida.*
Moosewood	*Dirca palustris.*
Squaw Bush	*Senecio aureus.*
White Elder	*Sambusus Canadensis.*
Red Elder	*S. pubens.*
White Elm	*Ulmus Americana.*
Slippery Elm	*U. fulva.*
Fir	*Abies balsamea.*
Gooseberry	*Ribes Cynosbati.*
Hemlock	*Abies Canadensis.*
Hackmatack	*Larix Americana.*
White Hazel	*Corylus Americana.*
Whithe Hazel	*C. rostrata.*
Hardhack	*Spirea Tomentosa.*
Tea Hardhack	*S. salicifolia.*
Hornbeam (Hop)	*Ostrya Virginica.*
White Hornbeam	*Carpinus Americana.*
Lilac	*Syringa vulgaris.*
Locust	*Robinia Pseudacacia.*
White Maple	*Acer Dasycarpum.*
Rock Maple	*A. saccharinum.*
Gray Maple	*A. nigrum.*
Striped Maple	*A. Pennsylvanicum.*

Swamp Maple.....*Acer rubrum.*
Red Oak.....*Quercus rubra.*
White Oak.....*Q. alba.*
Shadbush.....*Amelanchier Canadensis.*
Plum.....*Prunus domestica.*
Poplar.....*Populus tremuloides.*
Pine.....*Pinus Strobus.*
Rosebush.....*Rosa lucida.*
Raspberry.....*Rubus strigosus.*
Sumach.....*Rhus typhina.*
Mountain Sumach.....*R. copallina.*
White Spruce.....*Abies alba.*
Black Spruce.....*A. nigra.*
Juniper (Tamarack).....*Larix Americana.*
Pussey Willow.....*Salix cordata.*

The list might be considerably extended, but the foregoing embraces the principal, which serves to give an idea of prevailing growth and some few of the most prized and cultivated ornamental trees and shrubs.

Game, Fish and Birds.

In Waldo county, which is upon the seaboard, not much game is found. Ruffed grouse inhabit every grove of any size, but are exceedingly shy. Hares abound in our swamps to some extent. Snipe are occasionally met with, but woodcock are about extinct. Fur bearing animals are found to some extent; the fox, mink, raccoon and skunk, are the chief. Originally they were abundant, and in days of early settlements, or forty to sixty years ago, they were to be met with at almost every step.

Fish are scarce; brook trout, the prince of fish, between persistent fishing and dams across all brooks of size, and water polluted with sawdust from mills, have nearly all disappeared. Some varieties of inferior fish are yet quite plentiful.

Along shore, springs and autumns, good shooting may be had for ducks and geese which here pause on their migrations.

Good opportunities for fish culture are found in every town, but as yet we have no one who has engaged in that business. Smelts and tomcods are very plentiful during the spring in the bay and river, and later in the season the bay affords cod, haddock, hake,

mackerel, and porgies; the latter caught mainly for their oil, which is expressed, after they are boiled in large boilers, under powerful screws. The residue left, known as "porgie chum," is a powerful fertilizer, and commands a good price.

Lobsters, that once abounded along the sea-coast of the county, have been pursued to such an extent, that they are scarce and small, and command a high price.

The early settlers were familiar with the black bear, the deer, moose, wild cat, sable, and other animals now virtually extinct in the county. The streams then swarmed with "speckled beauties," and a tramp of half an hour beside almost any inland water would secure such a string as we never see now. Our waters can be restocked—should be—and cared for, that they are properly fed and protected. They may thus be made the means of supplying much delicious food, and from a source now barren.

Herring are largely caught in weirs and prepared by pickling and smoking, for the market. Salmon are caught in weirs to some extent. Belfast annually sends out quite a fleet of fishing vessels, some to the banks, and some along the coast.

A little attention to trout breeding, fishways to allow shad and alewives to ascend our larger streams, and protection of fish preserves, would in a few years add vastly to the food producing capacity of our inland waters. It is a subject well worth the attention of our leading citizens, and we hope ere long that fish culture may be inaugurated, and our streams and ponds be restocked with edible fish.

The song birds are the same as those of other sections of the State. They deserve protection and encouragement, for they are our safeguards against insect depredations.

The following list embraces most of the wild animals now found in the county:

Raccoon	*Procyon lotea.*
Skunk (Pole cat)	*Mephitis mephitica.*
Woodchuck	*Arctomys monax.*
Gray Squirrel	*Sciurus migratious.*
Red "	*Sciurus Hudsonius.*
Striped " (Chip munk)	*Tamias straitus.*
Flying "	*Pleromys volucella.*
Musk Rat (Musquash)	*Fiber zibethicus.*
Common Rat	*Mus. decumanus.*

Field Mouse.....*Hesperonmys myoides.*
Woods Mouse (Deer Mouse)..*Jaculus Hudsonius.*
House Mouse.....*Mus. musculus.*
Meadow Hog (Black Mole)....*Condylura cristata.*
Common Mole.....*Blarina talpoides.*
Mink (Martin).....*Pularius nigrescens.*
Weasel.....*Putorious cicognanii.*
Rabbit (Hare).....*Lepus Americanus.*
Hedge Hog (Porcupine).....*Erethizon dorsatus.*
Fox (Red and Grey).....*Vulpes, fulvus and argentatus.*
Otter (very rare).....*Lutra Canadensis.*
Fisher (ib.).....*Mustella Pennantii.*
Loupcervier (ib.).....*Lynx Canadensis.*

The principal fresh water fish are as follows:

Trout.....*Salmo frontinalis.*
Chub.....*Leucosomus Americanus.*
Shiner.....*Chirastama notatum.*
Red-fin.....*Plary-yrus carnutus.*
Sucker.....*Catastomus Bostoniensis.*
Eel.....*Annguilla Bostoniensis.*
Pickerel.....*Esox reticutatus.*
White Perch.....*Morone Americana.*
Yellow Perch.....*Percu flavescens.*
Horned Pout.....*Amiurus pullus.*
Roach.....*Pocus lineatus.*
Smelts.....*Osmerus mordax.*
Pumpkin Seed.....*Pomotis appendix.*

The following list embraces some of the more common birds of Waldo county:

White Headed Eagle.
Fish Hawk, (Ospray.)
Great Horned Owl.
Brown Owl.
Saw-whet Owl.
Great Footed Hawk.
Pigeon Hawk.
Sparrow Hawk.
Robin.
Redstart.
Pewee.
Night Hawk.
Canada Fly-catcher.
Yellow-rumped Warbler.
Winter Wren.
Gold Crowned Wren.
Ruby Wren.
Bluebird.
Brown Creeper.
Black-and-White Creeper.
Cedar bird.
Catbird.

Phebe bird.
Gr. Crested Fly-catcher.
Kingbird.
Kingfisher.
Chimney Swallow.
Barn Swallow.
Bank Swallow.
Martin.
Humming bird.
Water Thrush.
Olive-Backed Thrush.
Golden-winged Woodpecker.
Yellow-bellied Woodpecker.
Three-toed Woodpecker.
Downy Woodpecker.
Wild Pigeon.
Ruffed Grouse.
Crane.
Kildeer Plover.
Piping Plover.
White-bellied Nutbatch.
Yellowbird.
Bobolink.
Crow Blackbird.
Crow.
Bluejay.
White-throated Sparrow.
Chipbird.
Swamp Sparrow.
Black Cookoo.
Ash-colored Sandpiper.
Little Sandpiper.
Spotted Sandpiper.
Wood Duck.
Great Shearwater.
Loon.
Herring Gull.
American Gull.

Agricultural Organizations.

We have in Waldo county one County Farmers' Association, three Agricultural Societies, and eight Farmers' Clubs. That more clubs are needed, till every town boasts of one well-supported, live, working club, is apparent; too much in their favor cannot be said, when rightly conducted. That we have too many agricultural societies, is apparent, when we view the limited area of our county and the weakness consequent upon division of each society; one central county society, with auxiliaries in each town holding town exhibitions under the auspices of the town club, would add vastly to the effective power for good of these societies.

Waldo County Farmers' Association.—This was organized by a few of the leading, progressive farmers, pursuant to a call published April 20th, 1872. It meets monthly with different clubs, and in different sections in the county, except July and August. It has been the means of great good, for farmers are brought into contact with each other from different sections, and instruct and are instructed by an exchange of experience. Associated Dairying has been introduced and carried forward by its means, and new interest awakened by its influence. Such an organization

should exist in every county, and may be made to the county what the Board of Agriculture is to the State. The officers of this association are: A. G. Jewett, Belfast, President; George Woods, Belfast, Israel R. Grant, Monroe, Seth Thompson, Unity, Vice Presidents; J. W. Lang, Brooks, Secretary and Treasurer.

Waldo County Agricultural Society.—This society was organized in 1847. From a letter from the present Secretary, Mr. A. D. Chase of Belfast, I condense the following brief history of the society:

"Early in June, 1847, several gentlemen, feeling an interest in the welfare of the agriculturists of Waldo county, held a meeting at the old Court House in this city, for the purpose of taking into consideration the expediency of forming an agricultural society. At this meeting it was concluded that it was best to form a society, or organize under an old charter granted to a former society. Accordingly notice was given in the newspapers, that a meeting would be held at the Court House on the 3d day of July, to form a society or organize under the old charter. At this meeting the question of organization under the old charter, was discussed with animation and ability, and finally it was decided by a very large majority to form a new society, and the following gentlemen were nominated, by a committee of one from each town in the county, for officers, and were subsequently elected: Isaac Twombly, President; William G. Sibley, Secretary; Harry Hazeltine, Josiah Murch, Vice Presidents; John Hodgdon, E. A. Pitcher, Alfred Sawyer, C. H. Thompson, Samuel Marden, Mark S. Stiles, Allen Davis, H. H. Sherman, Thomas Ayer, Charles Prescott, Ithamar Bellows, Abner Littlefield, Levi Johnson, David Dolliff and Ebenezer Hopkins, were elected Trustees, and John Greeley, Treasurer; after which, voted, that the President and Secretary use their influence to procure a new charter from the present Legislature; voted to adjourn, to meet at the Court House August 25th, 1847.

At the meeting holden 25th of August, as per adjournment, there was a lengthy discussion upon the question of proceeding under the then present voluntary organization, and since the last meeting a charter had been obtained, and it was thought advisable to delay action until the society could legally organize. H. H. Sherman, one of the persons named in the act of incorporation, was chosen to call a meeting of the corporators, to be

holden at Brooks Village, on the 11th day of September next, at 10 o'clock A. M.

BROOKS, September 11th, 1847.

At a meeting of the major part of the persons named in an act incorporating the Waldo County Agricultural Society, approved by the Governor, August 2d, 1847, Isaac Twombly was chosen Chairman and William G. Sibley, Secretary.

Voted, That all persons who have become members of the voluntary society formed at Belfast, August 3d, be considered our associates under this act.

Voted, To accept the act of incorporation.

Charter Members.—Isaac Twombly, William G. Sibley, Harry Hazeltine, Josiah Murch, E. A. Pitcher, John Hodgdon, Alfred Sawyer, Charles H. Thompson, Samuel Marden, Mark S. Stiles, Allen Davis, Harvey H. Sherman, Thomas Ayer, Charles Prescott, Ithamer Bellows, Abner Littlefield, Levi Johnson, David Dolliff, Ebenezer Stevens, their associates and successors, be and hereby are constituted a body incorporate, by the name of the Waldo County Agricultural Society.

The present organization of the society is as follows: Daniel L. Pitcher, President; Jesse Townsend, Moses W. Frost, Vice Presidents; Hiram Chase, William W. Hall, Howard Murphy, David Lancaster, Trustees; A. D. Chase, Secretary and Treasurer.

The society is indebted to the amount of about two thousand dollars at the present time, but the prospect is quite bright that by the close of our autumnal fair, the debt will be among the past unpleasant reflections of our agricultural friends, and that we shall take new life and make our Society what it ought to be, the first in Eastern Maine."

North Waldo Agricultural Society—Was organized in 1861. It holds its annual exhibitions at Unity village, and embraces several fine farming towns. Its present organization is as follows: Seth Thompson, President; Benjamin Fogg, Vice President; Lindley H. Moshier, Secretary; Eli Vickery, Treasurer; H. B. Rice, Agent and Collector; George W. Clark, Benjamin Hunt, P. W. Ayer, David B. Johnson, Charles Hutchins, Charles Vose, E. Davis, G. McGrey, E. M. Baker, W. Stevens, C. Y. Kimball, James W. Wallace, Benjamin Ferguson, N. Gould, W. C. Gordon, C. Butman, Trustees. We learn the society is prospering. It owns no grounds or halls for exhibition.

Waldo and Penobscot.—This society was organized in 1868. It holds its annual exhibition on the grounds of the "Monroe Trotting Park Association." The society is in good financial standing. Its present organization is as follows: Freeman Atwood, President; John Goodwin, Vice President; E. H. Nealley, Secretary and Treasurer; T. Mayo, Librarian; R. W. Mayo, Monroe, Joel Lowe, Frankfort, F. W. Ritchie, Winterport, Amos Lane, Prospect, A. E. Nickerson, Swanville, J. W. Lang, Brooks, J. W. Wallace, Jackson, Amos Stevens, Dixmont, James Farnham, Newburg, Board of Trustees. This is the youngest, and claims to be the smartest society in the county. It has held good exhibitions and been successful in accomplishing desirable results.

Farmers' Clubs. *Belfast Farmers' Club.*—This club is composed of good material, and has accomplished much good. It was organized several years ago—Daniel L. Toothaker, Secretary. This club has suspended operations several times but always seemed to retain its vitality, coming to the front each time recuperated and ready for energetic labor in the field of progress.

Brooks Farmers' Club—Was organized March 9th, 1872; A. G. Rose, President; J. W. Lang, Secretary. It has a library of about sixty volumes and has good material composing it. A cheese factory organization is one of the outgrowths of its usefulness. It meets Saturday evenings; the attendance has gradually increased since its organization. There are evident signs of improvement within the circle of its influence.

Freedom Farmers' Club.—This Club was organized in March, 1873. D. B. Johnson, Secretary. This Club starts out with much enthusiasm, and we have no doubt of its future stability or usefulness, knowing the material of which it is made up.

Montville Farmers' Club.—Organized in 1872. Jonathan Hamilton, President; Z. T. Cooper, Secretary. A cheese factory company has been organized within the jurisdiction of this club. We learn from its energetic Secretary that its meetings have been well attended, and productive of much good. A paper and declamations together with select readings, during part of each meeting, has served to interest the young folks and draw in the older.

Newburg Farmers' Club.—This club is partly in Penobscot county, yet within the jurisdiction of one of our Agricultural

Societies. It is a smart club, and here a cheese factory company have made an organization, and owe their existence to the influence of this club. Meets Saturday evennigs—J. F. Hussey, Secretary.

Prospect and Stockton Farmers' Club.—This is our largest, best, and champion club. Holds its meetings Saturday evenings. J. R. Partridge, President; R. M. Trevett, Secretary. It meets alternately at two school-houses, one in Prospect, and the other in Stockton—hence its name. These houses are one and a fourth miles apart. It has a library, and a fair working sum in its treasury. It has sixty-six members, one-half of whom attend regularly. This a flourishing club and holds an annual fair which often eclipses that of the county societies in interest.

Unity Farmers' Club.—This club was organized several years ago, and is in good working condition. Unity is the headquarters of the North Waldo Agricultural Society. This club meets Saturday evenings—Thomas H. Cook, President; James Libbey, Secretary.

West Winterport Farmers' Club.—John York, President; Fred. W. Ritchie, Secretary. A live, wide-awake club, that has made its mark and stands on a firm basis. It has aided largely toward the establishing of a cheese company at Monroe village. Its President and Secretary are among the best farmers of the section and of Waldo county. It is doing good service.

Cheese Factories. There are five organized cheese factory companies in Waldo county at present, two of which are in operation. The others are erecting buildings and preparing for operations another season. The breadth in potatoes this year is narrowed up nearly one-half, which shows that farmers' are seeking more profitable crops and better cultivation.

Northport Factory.—This company was organized in 1872, and and erected and completed their buildings one year ago this fall. Jason Hills, President; Daniel A. Wadlin, Secretary; Jason Hills, D. A. Wadlin, Amos Pitcher, S. B. Foster, P. C. Hunt, R. W. Ellis, Board of Directors. Their Superintendent learned in the Strong factory. J. R. Hurd is Treasurer. This is the pioneer factory of the county. It was started by an energetic company of farmers who were determined to get out of the ruts of the old ways of farming. The stock consists of $2,500, divided into

shares of $50 each. It has paved the way and encouraged other places to embark in this method of dairying by associated effort. All honor to these men!

Brooks Cheese Factory.—A. G. Rose, President; Benj Knowles, Vice President; J. W. Lang, Secretary; M. Chase, Treasurer; A. G. Rose, J. W. Lang, George Moulton, Jas. Ellis, J. D. Jones, Directors. Capital stock $2,000.

Monroe.—W. Cates, President; Freeman Atwood, Vice President; E. H. Nealley, Secretary; Cyrus Dolliff, Treasurer; D. Dolliff, F. W. Ritchie, P. H. Cane, W. Cates, E. H. Nealley, Directors.

Montville Centre.—I. B. Thompson, President; John F. Bean, Secretary; Oramel Murray, Treasurer; E. H. Carter, Alonzo Bryant, R. F. Jackson, Charles Owen, Directors. Capital stock, $2,000.

Montville and Searsmont Factory.—This dairy company was organized, like the others, except Northport, in the winter of 1872. N. Smart, President; Z. T. Cooper, Secretary; A. S. Wentworth, Treasurer; Otis Wilson, A. Pease, L. Cooper, R. S. Ayer, Directors. The factory is in process of erection and will be ready in the spring of 1874. Capital stock, $2,500.

List of Members of Board of Agriculture from Waldo County.

1857—Thomas W. Cunningham, Belfast.
1860—D. Norton, Monville.
1863—Samuel Johnson, Jackson.
1866—P. W. Ayer, Freedom.
1869—George E. Brackett, Belfast.
1872—J. W. Lang, Brooks.

Newspapers of the County.—There are three weekly papers published in Belfast in this county. *The Progressive Age;* folio, thirty-two columns; republican; published on Thursdays; $2.00 per year; William M. Rust, editor and proprietor; two columns of agricultural matter. The *Republican Journal;* democratic; William H. Simpson, editor and proprietor; Fridays; two columns agricultural matter; thirty-two columns; $2 00 per year. The *Belfast Weekly Advertiser*, Emery Boardman, editor; G. W. Burgess, publisher and proprietor; independent; $1.50 per year; published every Tuesday; one column of agricultural matter;

twenty-four columns. The combined circulation of these papers is about 7,000 copies. These papers, especially the two first, which have been long established, have been of great service to the community, and have done much in spreading information among the people and benefitting our home industries.

What the Newspaper has done for the Farmer.

It needs but a glance over the past to see the advance that has been made in farming. Improvements of all sorts meet us wherever we turn. And perhaps in no class of the wide community is the improvement so manifest as in the agricultural masses of the country. As a promoter of knowledge, the newspaper holds no secondary rank. Its weekly visits ever bring something new—some fact in science, some better method of doing things, some experiment or experience teeming with usefulness; and, further than this, its language, its tone, and its spirit, inducing a habit of reading and inquiry, acts beneficially upon the thousands who read and come under its influence. Go back thirty years and see the state of the country when agricultural papers were almost unknown; the status of the rural population, and general information among them. We find the farmer without very many of the comforts he now enjoys, pursuing the time-honored practices of his ancestors, without ambition to excel that now actuates the farmer of to-day. We see him following superstitions that are now exploded, firm in his limited acquirements as the rocks about him, plodding on in old beaten ruts without using efforts to get out of them, content to let "well enough" alone. He was satisfied if his children got a little education, enough to read and write and "cipher" respectably, seeing no use for those higher branches he did not understand, and supposed had no use for. All this was perhaps well enough for their day and generation, when muscle was called for to subdue the wilderness and break down the stubborn soil. They served well the purpose of their day. Now, progress, resistless Yankee *energy*, has urged the former state of things out of the way, and inaugurated a new programme.

The newspaper has been greatly instrumental in this work. There is in human nature a groping for better things. With knowledge of their existence comes a desire to possess, and efforts for possession. So with knowledge of improved methods in farming came their application to practice. Improved breeds of cattle

were heralded by the press, their points discussed and farmers enlightened as to their merits; this led to their introduction. We see now no slab-sided, long-eared rail-splitter in the farmer's hog pen. They have become obsolete through knowledge and possession of better breeds. They do not *pay*, hence are not kept. The farmer of the present is a snug calculator. He has learned from his paper that farm accounts are beneficial and has adopted them. They help systematize his business and from system and order arises thrift. The old "native" breed of cattle have nearly all disappeared, their places being filled with thoroughbreds and grades of the same. The good and bad points of the various breeds have been so thoroughly discussed through the papers that almost every farmer is well posted in regard to them. It has come to such a pass that every paper maintains its agricultural column, even our religious sheets, made perhaps, more especially for sabbath reading. This general inclination toward farming and farmers, shows the tendencies of the times, and speaks volumes for agricultural progress. Most farmers have some idea of the mineral construction and elements of the soil, the elements contained in plants and fertilizers, which were almost wholly unknown thirty years ago. They are becoming somewhat acquainted with agricultural chemistry, and better understand how to adapt fertilizers to soils and crops.

The newspaper has discussed these topics and the farmer has learned from them and been led thereby to seek other sources of information. Instead of orchards with fruit fitted for little else than cider, we find now the choicest kinds. Small fruits are cultivated where before unknown, unless they grew wild and uncared for. The better varieties have taken the places of the old and the garden presents an attraction hitherto unknown. The home has been adorned by shade trees, shrubbery and flowers outside, while inside books and pictures lend their charms. There is something deeper, pleasanter, and better in that family circle at the farmer's fireside than before.

The newspaper, especially the agricultural newspaper, has left the impress of refinement and progress in many a household, and yet its mission is just begun. The future is a broad field in which it will move on to new triumphs, new heights, and new usefulness. We all poorly realize what we owe the newspaper and public journal for the advancement science, agriculture and civilization have made. Take them away—blot them out and we

retrograde more rapidly than we have ever advanced. Let them be well supported and they in turn will support us.

The press has an all-powerful influence and is the lever which moves the world of mind. It argues favorably for the citizens of Waldo county that three weekly papers find support therein. Besides these, papers from out the county, especially papers largely devoted to agriculture, find a good patronage. Such papers as the Maine Farmer, Lewiston Journal, Boston Cultivator, Massachusetts Plowman, New England Farmer and Country Gentleman, are taken in the order named, quitely extensively, in all the rural towns. There is also an eagerness manifested to secure the reports of our State Board of Agriculture, and they are read and prized. This speaks well for the farming community in point of progressive intelligence.

Emigration.

To this source we may trace very much of the reason why Waldo county, in common with the whole State, has not made greater progress in the agricultural and industrial arts. The restless, roving spirit of the Yankee element of New England, is manifest to every close observer. That same spirit of adventure, and love of freedom, and seeking after novelties, that was so conspicuous in peopling these western shores from Europe, still operates and urges westward the inhabitant of the more eastern portions.

Maine has contributed of her hardy sons liberally to help people the west. Waldo county has not been behind in this exodus. Her sons and daughters are found in every State of the wide Republic. The white sails of her ships are mirrored in every sea, and her adventurous sailors are found the world over. This drain to oceanward and to the sunset lands has materially retarded her growth and development. While other sections have been built up in consequence, no inflowing immigration has replaced those who have sought the sunny south, the prairied west, or the Pacific slope. We often hear of the great success of some who have gone to Prairie-land or Eureka, but we do not hear of the far greater number of failures; and, too, many of the reports of fabulous successes do not bear investigation. Reports never lose by traveling, and "distance lends enchantment to the view." We believe it best and would counsel adherence to our native place. If we *must* move, instead of seeking the "shakes" of the west,

let it be to the broad and fertile acres of our own Aroostook. It is hard regaining in the new and strange anomalies of the west, the old-time society, privileges and enjoyments, which, to an eastern man, make up the best half of life.

The late war, which took so much of blood and treasure from the nation, bore with full weight in sacrifices upon Waldo county, and we can see plainly the check given to industrial progress by its agency; while at the same time we feel in our homes and by our firesides the cost of a nation's life.

We believe with the better knowledge of our resources and the introduction of manufactures, emigration will gradually grow smaller. A better knowledge of western actualities will also tend to, as it is already doing, prevent many from going west. The work for the progressionist is to but fairly present truth understandingly to secure his points. This is being done, and has its visible effects in decreased emigration from our borders.

Farms and Farmers.

We have visited some of the energetic and leading farmers in several towns, and follow this with description of their farms and farm practices. We have selected these men, not because there are not other farmers in the county just as good, but because we could visit them more conveniently, and because they are worthy to be patterned, and well represent the possibilities of the Waldo county farmer. Our thanks are due them for kind hospitality, and for facilities rendered to obtain information. They represent what may be done at farming in Waldo county where brain is blended with muscle in operating the farm.

The "Great Farm," Jackson.—The "Proprietors," who bought up a large part of the "Waldo patent," Messrs. Sears, Thorndike and Prescott, early established a farm of over a thousand acres near the centre of the town of Jackson, which was intended as a summer resort for themselves, and to aid in colonizing their lands. Here they conducted farming on a large scale, built a large, fine house, and large barns. They employed a large force of hands, and introduced blood stock, and new varieties of seeds. It has been with extreme difficulty that we have obtained reliable data of this farm, and this will render our description somewhat imperfect.

Through this farm runs a brook of considerable size known as

the "Great Farm brook," which is one of the tributaries to Marsh river, uniting with it at Monroe village. The land was of a rolling surface with some interval bordering the brook. The buildings were upon a swell of land north of the brook, and some fifty rods from the highway, and had access to the same by means of a wide avenue, bordered by elm and other shade trees. The house was a large two-story, roomy, structure, with ell and outbuildings attached. These buildings were considered almost a palace in the simple days of the early settlements. Two large barns—one known as the "Egypt"—with several smaller ones completed the outfit. An orchard of large extent was set out early in the history of this farm, and when it came into bearing, a cider mill was built. The prospect from the buildings is beautiful and extensive.

The farm now has fallen much to decay and contains but four hundred acres of the original one thousand. It is owned by Mr. N. E. Carpenter. The fields, except the intervales, produce little other than "June grass," except the newly seeded pieces. The buildings are but wrecks of what they were once and its ancient glory has departed. The stream that winds across the farm contains a few trout, but is the most persistently fished stream in the county.

The proprietors used to make their summer pilgrimage in carriages, all the way from Boston, occupying some two weeks in the journey. Think of this, ye who can hardly spend ten hours to go the same distance over iron rail. Think of those jolly old school gentlemen, leisurely jogging along in their coach and span, taking life easily, jolting over the country highways. Their arrival and departure was a noted event in the annals of the "Farm." Shooting, fishing, cordiality, and sociability marked their stay, while the crew of laborers were stimulated to feats of work by their presence, and their pennies.

Their stock was a source of pride and gratification to the proprietors. Water was brought three-fourths of a mile from the slope of a hill to the south, in a lead pipe and supplied to the buildings. The first overseer of the farm that we can learn of, was a Mr. Perry who was there seven years, or from about 1807 to about 1814. Whether clearing was commenced under his direction, or by a former employee, we are unable to say. The towns adjoining were settled between 1795 and 1805, so we infer that Mr. Perry may have been the first foreman employed to start the farm, and direct its development. In 1814, Mr. Timothy

Thorndike, from Jeffrey, N. H., nephew to Col. Thorndike, one of the proprietors, took charge of the farm as foreman. Mr. Thorndike was there eight years, or till 1822, when he settled in Brooks, on what is now known as the Woodbury Edwards place. One of his sons is now a merchant in Belfast, and from whom we have obtained many facts regarding the "Farm."

Col. Thorndike imported a large number of Shorthorn Durham stock from England, during Mr. Timothy Thorndike's service on the farm; the larger part of which went to Kentucky. Several were sent to the farm, together with some Spanish Merino sheep, and jacks for service of mares. Devons were also put on the farm afterward, and during Mr. Thorndike's stay, and also before an infusion of the "Vaughan" stock from Hallowell. Mr. Clapp from Portland, succeeded Mr. Thorndike as overseer. Other blood animals were from time to time introduced, which have become blended with the stock of the county and has done much good. But to this statement we wish to add the qualifying remark, that the introduction of Merino was unsatisfactory, and regarded as a failure. They proved weak, tender, and unfit for the climate. Perhaps in the new settlement and hardships of the times they did not receive the care they might or ought to have had, and this caused the dissatisfaction given.

Many young men came from New Hampshire and Massachusetts, and took up lots of wild land from which to make farms, working on the "great farm" to pay the first installments. Beside being a pleasure resort for its owners, it proved to be a means of developing the country about it, and of accomplishing thereby good results.

Farm of J. G. Reynolds, Brooks.—The farm of this enterprising farmer lies in South Brooks and consists of two hundred acres of land, mostly of upland gravel loam; although considerable moist land occurs in one field, which is favorable for the production of grass. Considerable has been underdrained; the drains are opened three feet deep with spade and pick, then field stone filled in and covered; an open course is left at the bottom of the drain for the passage of water. Top-dressing has been considerably practiced, and Mr. Reynolds believes it gives best results on the most porous soils he has; he also believes this practice best adapted to leachy soils. The stock of this farm consists of some fifteen head of cattle, two horses, and one hundred sheep. Usually from two to

four cows are kept. The barn is one of the best in the county, forty by sixty feet, twenty feet posted; it has two main floors, one above the other, ample mows and tie-up, horse stalls, and all necessary conveniences; it was built some five years ago, is finished outside, shingled on walls, and has a ventilator on the roof. A barn, separate from this, accommodates the sheep. Mr. Reynolds does not use the cellar beneath, having prejudice against barn cellars. The house is a story and half, with ell and outbuildings connecting it to the larger barn, giving ample accommodations for hogs, hens, and storage for fuel and farm tools.

One remark of Mr. Reynolds deserves thought and attention, for it has weight not at first apparent: "The only farmers that are making money are those that are feeding the most provender; those that are making most, feed the most corn and other grain." He feeds yearly from three hundred to five hundred bushels of western corn, besides all he raises. His system is mixed husbandry, which he believes best adapted to the farmers of this county in general. If he were to make a specialty it would be sheep. He cuts from fifty to seventy tons of hay per year, plants one and a half acres in corn, and has hitherto raised barley and oats principally. This year he has sown three acres in wheat. He has a small productive orchard near the buildings. Applies about forty ox-loads of barn dressing per acre to his lands, harrowing in new dressing, and putting old in the hill. Mr. Reynolds sells some hay, but more than replaces it with corn used. He believes only good farming pays. His farm is very pleasantly situated at the intersection of four roads, is eight miles from Belfast and five from tide water. Mr. Reynolds has been on this farm some fifteen years, and has greatly increased its productive capacity and made money while so doing. In this, and for this, we claim for him the well-deserved title of a model farmer.

By the examples and the accomplishments of these representative farmers we may pattern and learn lessons of value. They show to us facts and possibilities that may be attained if we but use the same efforts. Though it be not precisely in the same branches, it will be in the same direction, and equally profitable to us, and to those about us.

John M. Dow and Son, Brooks.—This farm is situated on a high elevation of land and consists of one hundred acres, fifteen of which are in wood mostly second growth and valuable. The

soil is a deep granite loam, in places a sandy loam, deep and strong, with hard subsoil. The farm is divided by the county road leading through West Brooks from East Thorndike to Belfast. The buildings consist of story and a half farm-house with ell; a neat, tasteful structure. There are two barns, one nearly new forty by forty, finished outside, and well fitted up inside. Another barn about same size, with commodious yard, gives sufficient storage for the crops raised. An orchard just coming into full bearing, grafted with choice varieties, attests Mr. Dow's skill as an orchardist. Over one hundred bearing trees are in this orchard, and a thrifty nursery shows that additions are soon to be made from a reliable source. Mr. Dow prefers home grown trees. The farm stock consists of two horses, two colts, three cows, one pair of oxen, six young cattle and twenty-five sheep; the stock are grades. For hoed crops Mr. Dow usually plants one-half acre corn, four acres of potatoes with half an acre in garden and roots. He has always raised wheat, and has two acres this year; four acres oats and other grain. Cuts thirty tons of hay. The potatoes are generally raised on rough pasture land turned over. Mr. Dow applies twenty to twenty-five loads of manure per acre, generally spreading on the furrow and harrowing in; always applies manure to land he is seeding down to grass. Much rough, hard land on this farm has been broken down and pulverized, made smooth and put into handsome fields. The farm shows to disadvantage from the road by reason of out-cropping ledge, and a steep side hill on the west. Considerable stone wall of substantial character has been built and some drains laid. Top-dressing moist grass lands has been practiced to some extent. Mr. Dow does not use superphosphates, finding their cost too great. Ashes, lime, and plaster are used to some extent on grain and hoed crops. Mr. Dow came from China, Kennebec county, some twenty-nine years ago and located here, and he has been successful and built up a good property, a pleasant home and a fine farm. In this we commend his example to the young men of our county, and think his success must satisfy the doubtful, when they ask, "does farming pay?" Industry and economy are the mainsprings of success in farming, when coupled with the requisite knowledge that adapts ends to means, and means to ends. The State of Maine offers, we become more and more satisfied as we investigate, inducements as good, nay better, than any other State, to the young men who are natives of her soil. Taking a view

of every advantage and every defect, comparing our own stock with others, we are satisfied, and forced to the conclusion that this is so. The success of our farmers amply backs up the statement.

Farm of P. W. Ayer, Freedom.—Two and one half miles west of Freedom village, on a high ridge of land, lies the farm of Mr. Ayer. The soil is granite in structure, light and easily worked, with hard subsoil. The fields lie well for convenience in tilling and are large and smooth. The farm contains three hundred acres of land, one hundred of which is wood. The fences are of stone wall and cedar "yoke fence." Most of these consists of a wall foundation with cedar "yoke fence" built upon it. We seldom find a farm so well fenced. There is no interval or swale land in the fields. The buildings consist of a large, roomy, old-fashioned, one-story farm house, in fair state of preservation, with convenient outbuildings; two barns, one forty-three by fifty, the other forty by ninety-six. These are conveniently arranged, and comfortable. The location of the farm buildings is very pleasant, and commands fine views of the surrounding farms to the south, east and north. The garden is quite extensive, and well kept. Small fruits as well as vegetables receive care and attention. The garden is surrounded with a neat, substantial fence of pickets —the latter a point of some importance. Mr. Ayer's orchard is not extensive, but young and thrifty. The farm stock, all told, consists of about thirty head of cattle and horses, and forty sheep. He has three horses and three colts, six cows, one pair oxen and the remainder are young cattle. He has four thoroughbred Shorthorns, viz: Bull, "Knight of Geneva,"* three years old; cow "Flora,† five years old; "Duke of Waldo," one year old; "Rose of Freedom" two years old. He has also eight yearlings by

* "Knight of Geneva" was bred by James O. Sheldon of Geneva, N Y., and purchased by Mr. Ayer of Augustus Whitman, Fitchburg, Mass. The following is his pedigree: Got by "4th Duke of Geneva," 7931; dam, Belle Marion, by Red Duke; Maid Marion 5th by Albion, (2482); Maid Marion 2d by Lord John, (11728); Maid Marion by Robin Hood, (9555); Lily by Lealoh, (8797); Lily by Young Vandike, (8933); Dutchess by Young Spectator, (8619). "Fourth Duke of Geneva," 7931, is a full "Bates" bull; was bred by James O. Sheldon, Geneva, N. Y.; got by "Baron of Oxford" (25370); dam, "7th Dutchess of Thorndale," by "2d Grand Duke" (12960), in 1869, and a half interest in him was sold to Messrs. Walcott & Campbell, for $4,000.

† "Flora," was bred by Josiah Eastabrook of Royalston, Mass. Purchased by Mr. Ayer of Mr. Whitman.

Knight of Geneva. Duke of Waldo and Belle of Freedom, are out of cow Flora. These animals all show the good points of the breed and are a credit to their owner. Mr. Ayer deserves especial mention for his efforts to improve the stock of the county, and offers to the farmers at reasonable rates, access to the best blood they can use in breeding. It required some nerve to "pitch in" and introduce at great cost these fine animals, but we are sure he will meet his reward in due season.

Mr. Ayer has some fine Cotswolds and grades of the same, also as a pure blood Yorkshire boar. He pastures sheep on one pasture till they spoil it for themselves, by causing too rank a growth, then puts on cattle which thrive well on the rich feed. He has a cow of the Durham blood, a relic of Col. Thorndike's "Great Farm Bull" blood. She is a fine representative of the old Durham strain. His cows all show extra milking qualities.

On this farm are ususally planted two acres corn, four acres of potatoes, and four to six acres wheat, and two acres oats sown. The cut of hay is about seventy-five tons annually. Mr. Ayer uses considerable provender during the year, believing that it pays to keep good stock, and keep it well. His thoroughbreds are fed no better than his grades. Mr. Ayer has done a great deal of labor on this farm, building fences, hauling stone and laying wall, smoothing up the fields and improving it in other respects. He has the satisfaction of knowing he has one of the best farms in the county and that it is paying him well. He plows in his green manure, putting twenty-five ox-loads to the acre. Old manure he spreads on the furrow and harrows in, or puts it in the hill. The second plowing is a little deeper than the first so as to bring up and mix with the top soil, the residue of the manure left from the year previous that was plowed under. It is a pleasure to visit such neat, well cared for farms, and doubly so when stocked as this is, with nice blood stock, that give promise of utility not only to their owner, but to the community at large.

Elisha Johnson & Son, Freedom—The farm of these enterprising farmers lies one and one-fourth miles west of Freedom village on a pretty swell of land, and has a southern aspect. It consists of one hundred and forty acres of upland soil of which twenty-five acres are woodland. It lies on both sides of the county highway and is conveniently partitioned by substantial cedar "yoke fence," stout and strong. The soil is a fine gravel loam over a stiff gravel

subsoil. Some portions have been drained by rock drain, thereby very much improving the wetter portion of the farm. The buildings consist of a story and a half house, large, well arranged and roomy, with outbuildings connecting it with the barns. The main barn is forty-five by sixty-five with two main floors and cellar beneath. The arrangements for making and saving manure are very good, and worthy of imitation by all farmers. The contents of the privy and waste water from the house are all caught and utilized by absorbents conveniently placed, and the hogs are levied upon to aid in the manufacture of fertilizers. We noticed in one stye, a full blood Yorkshire boar from the stock of Hon. Warren Percival of Cross' Hill. We think highly of this breed, judging from the make up of the animals, and their general appearances. The stock on this farm are grades, and consist of one yoke of oxen, four cows, two horses and twenty-six sheep, several of which are pure blood Cotswolds, from the stock of Mr. Hanscomb of Albion, and several high grades. Together they form one of the best flocks in the county, in quality.

There is an extensive cedar swamp on this farm which furnishes material for good fencing. There is an old and young orchard, the former of which is some fifty years old, and decaying; the latter is just coming into bearing and is grafted in the limbs with choice varieties. The trees were, most of them, raised in a nursery on the farm. Some twenty-five New York trees are in another place and have been set only a few years. Mr. Johnson prefers native trees. The young orchard is mulched about the trees with white-ash shavings from the shovel handle factory at Freedom. The soil, which is a witch-grass sod, is mellow and loose beneath this mulch. The trees are washed every spring with weak lye, or strong soap-suds. A fine nursery is in process of cultivation, which promises to furnish trees enough for the whole neighborhood. We noticed some stocks of bees, a rarity this season among the farming community in the county. The season of 1871, and two succeeding winters, worked vast damage to the bee interests of Waldo county. One of the pleasing features of this farm was the garden filled with vegetables and small fruits. Considerable space is devoted to this and it pays well. The condition in which it is kept speaks volumes for the industry and zeal of these representative farmers. Phosphate is used to quite an extent on corn, on this farm. Sometimes it is sown broadcast on grain and to good profit. One piece of about three

acres is under summer tillage with oats. This farm cuts some thirty or more tons of hay. Witch-grass abounds in most of the fields, but makes a fine quality of hay. Plaster is sown as a top-dressing for grass, just as the snow is going off, at the rate of 200 lbs. per acre, with good results. Corn is planted on inverted sod. The land is plowed the fall previous, manure spread and harrowed in; in the spring it is worked and phosphate put in hill with the corn. Two and a half acres of corn, three of potatoes, and three of wheat are annually planted and sown; about three acres of other grain is cultivated, sometimes barley and sometimes oats. Manure is applied at rate of twenty to thirty ox-loads per acre on the furrow and harrowed in. The situation of the farm buildings is pleasant, and the surrounding landscape presents picturesque views. Their arrangement is handy and facilitates the labor of caring for the stock and doing the household work. Brain as well as muscle, has evidently been employed judiciously in the building up and managing of this excellent farm.

Farm of John H. Fogg, Jackson.—This farm lies partly in Jackson, Waldo county, and partly in Dixmont, Penobscot county, and contains two hundred acres, situated upon one of the ridges on the southern slope of the Dixmont hills. Mr. Fogg has owned this farm about ten years. When he took possession of it, it was in a somewhat low state of productiveness. He has cleared about twenty acres, and by prudent and judicious management, raised its production of hay to an average of about sixty tons. The pasturage is excellent of which there is an abundance, and it is well watered by living springs and streams. On the farm is plenty of wood and lumber, one piece of timber land being valued at about $1,500, stumpage.

The stock usually consists of about twenty head of cattle and one hundred sheep, with several horses. There is an excellent orchard upon the farm near the buildings, and a promising nursery that means *replenish.* The farm buildings consist of a story and half house, with ell and woodshed, granary, carriage-house, &c., connected—a tasteful and elegant stand. Two barns, one of which has recently been remodeled and enlarged, manure sheds, hen-house and sheep barn complete the outfit. Mr. Fogg has in his recently repaired and modernized barn, one of the best in Waldo county. His arrangements for tying up his stock in separate apartments, the ease with which they can be attended, and a full supply of water in the yard, are points worthy of imitation.

Mr. Fogg's method of procedure is to plant potatoes and corn upon newly broken up land, with light dressing—the potatoes getting nothing but plaster—then the next year apply to these stubble pieces forty ox-loads of yard manure per acre upon the furrow, sowing grain and laying down to grass. The home field has been so treated once, and he is now in his second rotation of fertilizing it. This field is very well located and easily worked, and was in the most exhausted state of any part of the farm when he came into possession. He has raised as high as one hundred and twenty-five bushels of beans in one year. These were from burnt land. We noticed a large piece in beans that from their thrift bespoke that he intends to maintain position of "deacon" this year. These were on plowed land, and were known as "Canada Blue-Pod," a very prolific bearer and a small, handsome white bean.

One of the most pleasing features of the household economy was the never failing cistern of water beside the sink in the kitchen. The water is brought some distance in lead pipe, and supplies both house and barn with pure cold water the year round. We could but think of the very many homes where running water could be introduced at small expense, and where the time-honored pail still takes its passage by hand from well to house and house to well, wasting the time and strength of the owner. The outlay of a little head work and money would secure a full supply at the place desired.

Two hundred bushels of potatoes are the average product on this farm, and one ton of hay per acre. Oats is the principal grain grown. Mr. Fogg's specialty in the stock line is fine large oxen, of which he intends to have the best. Perhaps the question, "Will farming pay?" is as well answered at this farm as anywhere in the State. Within a period of little more than twenty years, Mr. Fogg has accumulated a property of eight or ten thousand dollars, supported a large family, and made a good living and reputation by farming, managing wisely and shrewdly and using brains in his business. His is an example to be imitated, and at the same time presents an undeniable evidence that farming in Waldo county is a safe, sure business, when conducted on strictly business principles.

Farm of Jason Hills, Lincolnville.—In reply to questions propounded by letter to Mr. Hills in regard to his farm practices, the following reply has been received by the writer. It is so con-

densed, concise, and to the point, that we attempt no pruning or extenuation, but present it with pleasure, thanking Mr. Hills for kindness in answering our inquiries. Mr. Hills is President of the Northport Cheese Factory, and was one of the foremost in introducing associated dairying into our county. The farm of Mr. Hills, by his skill and industry, has been made one of the best in Southern Waldo:

"In answer to your letter, I will say that my farm is situated in the northeast part of Lincolnville. Fifty years ago it was in possession of Enoch Knight. In 1833, Mr. Knight sold it to my father, Isaac Hills. In 1840 I came into possession of it from my father. At this time, it was under a poor state of cultivation and somewhat worn out, cutting about thirty tons of hay. The homestead formerly consisted of one hundred and fifty acres, to which I have added one hundred acres, making in all two hundred and fifty. I have in wood about twenty acres; in pasture, one hundred and fifty acres. Fences about one-half stone wall and one-half wooden fence. My orchard consists of two hundred grafted trees, chiefly Baldwins and Russets. My farm buildings consist of a one and a half story house and ell. House twenty-six by thirty-two; ell seventeen by thirty; workshop twenty by thirty; woodhouse twenty by forty; barn connected with house one hundred by forty-five—twenty foot posted. Cellar under house, barn and ell. No barn-yard, but a passage to the barn cellar covered with a shed. The barn cellar is used for a cattle yard, and is supplied with water from an acqueduct from a good spring. Garden only sufficient for own use. Fruit yard contains pears, cherries, grapes, currants, gooseberries and strawberries. In 1872 I wintered fifty hens, from which was sold $137.00 worth of eggs and chickens, besides the poultry and eggs used in family. I think poultry keeping profitable.

"My method of applying manure is as follows: For hoed crops, I spread nine or ten cords of manure per acre, taken from the barn cellar and spread on the furrows and covered with the harrow or cultivator, and at the same time applying nine or ten cords per acre, which was hauled out the fall before, in the hills, making from eighteen to twenty cords per acre, per annum. The same ground I put into grain the next year, to which I apply nine or ten cords more manure per acre, spread on furrows and harrowed or cultivated in. Ashes are applied as a top-dressing. Plaster is used in the hills for corn and potatoes. Guano has been used, but

not with satisfactory results. I use about twenty-five cords of muck annually as an absorbent. I also use ten or twelve cords of sawdust for the same purpose.

"I cut from seventy-five to one hundred tons of hay. Usually commence haying July 5th and continue about one month. I use mower, horse-rake and horse-fork. The first of haying I want three days' sun to make it sufficiently. I intend to have the hay cocked up every night. To renovate pastures sow oats two years in succession, seed the second year. Last year I raised eighty bushels Lost Nation wheat from three acres. I always seed my fields with wheat. I use twelve pounds clover, twelve quarts herdsgrass and twelve pounds redtop per acre. My stock comprises thirty-five to forty head of horned cattle, two horses and twenty sheep. My neat stock is divided as follows: Four oxen, twenty cows, sixteen young cattle, divided equally as to heifers and steers. The breed is "Native" and grade Durham.

"My upland is a granite soil, free from stone. I have interval which is alluvial, deep and productive, consisting of about twenty-five acres. I break my ground as soon after haying as convenient, for corn and potatoes. I plow about eight inches deep. For renovating old fields, from four to six inches deep. from about fifteen cords per acre and sow wheat and grass seed on the following spring. I plow ground, previously in corn and potatoes, in the spring, about six or eight inches deep. For harrowing, I use the "Knox Cultivator." I hoe my corn twice with a hand hoe, after going over it with cultivator. I use the horse hoe for covering and hoeing. I have laid about three hundred rods of underdrain. I dig about three feet deep, lay an open drain at the bottom with stone, then dump small stone to fill the ditch within one foot of the surface, then cover with brush and dirt. I furnish the cheese factory with milk about six months in the year; the remainder of the time make butter. For special forage crops I sow corn. Last year I sowed one acre of the Southern variety. I feed oats and potatoes in winter to my stock of cattle."

Farm of Mark P. Palmer, Thorndike.—This farm embraces over two hundred and fifty acres, nearly half of which is in woodland. Soil is of fine texture and granitic in its composition—perhaps we ought to call it fine gravel loam. It lies prettily, having a northern and western aspect, and is bounded on two sides by the county highway. The fences are of cedar, built in a substan-

tial manner, "stake and yoke fence." One field has twenty acres, another forty, and both are smooth as floors. The farm buildings consist of an old-fashioned, double-tenement farm-house, with ells and buildings connecting house with barns. Three barns of large size, well finished and conveniently arranged, give ample room. There is considerable orcharding on the farm, mostly young and vigorous trees. The stock usually kept consists of one pair of oxen, five cows and six young cattle; two horses, several hogs and one hundred sheep. Mr. Palmer feeds from one hundred and fifty to two hundred bushels of provender per year, and believes it pays best to keep good stock and to keep it well. Water is supplied from wells, and is convenient to the house and yard. The farm has good pastures, and Mr. Palmer believes that sheep are the best renovators for pasture lands. The hoed crops are cultivated to quite a large extent this year. We find one acre in corn, five in potatoes and about an acre in other hoed crops. Eight acres are sown in wheat, three in oats and three in barley. The method of applying green manure is to put twenty-five ox-loads upon the acre, spread and plow in. He does not believe in putting on the furrow and harrowing in, except with old dressing; nor does he practice top-dressing grass lands or underdraining. Has used leached ashes at the rate of one hundred and fifty bushels per acre, harrowed in on the furrow, with grain, with good success, and has observed great benefit from them in succeeding grass crops. Would prefer unleached ashes. The stock are grades, Jerseys, Durhams and Herefords. Sheep are grades of all kinds, but a picked flock. He believes mixed husbandry the best for our farmers to follow.

The farm produces fifty tons of hay, all of which is upland. Mr. Palmer raises his own bread. Sows Lost Nation wheat, plants Orono potatoes and believes in clean seed of the best kinds to be had.

Farm of Isaac Coffin, Thorndike.—Mr. Coffin occupies the farm on which his father settled, and cleared from forest some sixty-five years ago. Has five hundred acres, all of which is upland, and which lies upon a high, round swell of land. The farm buildings are pleasantly located and command an extensive view. The house is two stories, well planned and convenient. Suitable outbuildings are connected with the ells, and near by is an excellent barn, forty-five by ninety-five, thoroughly built and finished. A smaller

barn forms one side of the yard, which is upon the sunny side of the large barn. One hundred and twenty-five acres of nice woodland is found upon this farm. The annual cut of hay is about ninety tons. The stock consists of some twenty-five head; six to eight large oxen, six cows and twelve head of young stock, two horses and fifty sheep, form the usual quota. Mr. Coffin has preserved the strain of blood obtained from the importation of Durhams by Col. Thorndike, on the "Great farm" in Jackson, some sixty years ago. He sold a pair of oxen a few years ago whose girth was almost nine feet, and which weighed nearly six thousand pounds. He has some fine grade Durham stock of cows, steers and heifers. Mr. Coffin spreads his green manure and plows it in, using sometimes old manure in hill, but not generally, applying twenty to thirty ox-loads per acre. He thinks top-dressing moist grass lands pays. Uses plaster on corn and potatoes. He has used ashes on grass lands as top-dressing, to advantage. Thinks mixed husbandry the best method for the great mass of farmers to follow. On the farm is an orchard of some extent, but it is declining and he has not set out any young trees to take its place. Cuts his hay early. Wilts and partly cures it in the field and stows it in generally the same day, if it is good weather, and likes this plan better than to fully dry it in the field. He usually plants six to eight acres potatoes, one to two acres corn and sows ten to fifteen acres of grain. The farm is divided into two parts by the county road, is well fenced and kept in good order, neat and trim. This farm lies near Mr. Palmer's, and both are among the best in Waldo county.

Farm of F. W. Ritchie, Winterport.—This farm consists of about one hundred and eighty acres of strong, gravel loam, of a fine texture, not very rocky. It lies upon both sides of the road leading from Monroe village to Bangor. A high, ledgy ridge runs back of the house, upon the northwest side, which effectually shelters the farm buildings from west and northwest winds. The house and barns are prettily embowered by the orchard, which extends upon both sides of the road some distance each way. The house is a story and a half, with Gothic roof and ell and woodhouse connected. It is well planned and convenient, and has a pretty flower yard in front—Mrs. Ritchie's special care—and she finds time aside from caring for her house to keep all in neat, trim condition. Plants in pots, disposed about the door, add a charm to

the place, and in winter enliven the sitting room with their presence. Two barns, conveniently arranged, with large yard between, give ample storage room for fodder and shelter to stock. We noticed the yard was well provided with dry muck, which is to be used as top-dressing for moist grass lands this fall. The orchard—Mr. Ritchie's strong point—consists of about five hundred trees, in full vigor. They were mostly raised in nurseries on the farm. About twenty-five New York trees are in the orchard, which are thrifty and vigorous, and have been set about fifteen years. Mr. Ritchie prefers home-grown trees. The deep snow of the past winter broke down many branches of the trees, injuring some greatly. We saw some fine standard pear trees, but Mr. Ritchie has no faith in dwarfs, and pointed out some decaying stubs in support of his argument. In his small fruit garden are found strawberries, several varieties of currants, gooseberries, grapes, plums and blueberries. He is enthusiastic over the culture of currants and of blueberries. A fine kitchen garden, with a large bed of onions, among other common vegetable products, shows that he appreciates "biled victuals." Mr. Ritchie finds the best fall apple for him is the Williams' Favorite, and next the Sops o' Wine. For winter fruit, he would recommend in their order Baldwin, Naked-limbed Greening and Nodhead. He finds the Bellflower does best on moist land, and the Baldwin best on dry, rocky land. He mulches his trees to some extent, and keeps the land about them in a good state of fertility. Trains them low, with spreading tops. He thinks why many fail in orcharding is that they do not adapt varieties to soil. Certain kinds, like the Bellflower for instance, thrive best in moist soil and bear best in wet years, like that of 1872. He has some three acres set in cranberries, only a small part of which has yet come into full bearing. From six square rods, last fall, he gathered nine bushels, which sold readily in Bangor for $3.50 per bushel.

The usual cut of hay on this farm is from sixty to seventy tons, and is all upland or English hay. He has one acre in corn, three acres in potatoes and five acres in grain this year. Applies from fifteen to twenty large ox-cart loads of manure per acre, and never lays down a field to grass without having it well enriched, hence always gets a good "catch,"—a hint worth taking by all farmers. Mr. Ritchie believes in top-dressing wet or moist grass lands in autumn, (and only these) and at no other time. He does not believe in fall feeding grass fields with cattle. He makes

large quantities of dressing with hogs, of which he keeps four, and keeps them well supplied with muck, turf and litter of all sorts. Plows in his long manure and uses old in the hill for corn and early potatoes. His stock consists of from fifteen to twenty head of cattle. Has at present two horses, four cows, four oxen, and six young animals, with twenty-four sheep, and intends to keep cows to a larger extent hereafter, being interested in the Monroe Cheese Factory, which is but two miles distant. His stock are grades of Durham, Jersey and Herefords. He uses the "Clement's cultivator" on stubble land, and much prefers it to plowing. It does its work better and faster, and can be gauged to pulverize any required depth less than one foot. It is excellent for preparing newly broken up sod land for planting. Uses a cultivator with small shovel teeth, made of a mill saw, on hoed crops. He has about thirty acres of good wood land, much of which is second growth and valuable. Mr. Ritchie is President of the West Winterport Farmers' Club, and a live, practical, progressive farmer. He believes in "Maine for Maine men," and manifests his faith by works. Would that Waldo county had many more such energetic, wide-awake farmers, to give agriculture that impetus which would result in rapid, onward moves.

No one can visit such country homes and see peace, plenty and independence all about and not be in love with rural life. It gives new ideas to the weary brain and courage to the failing heart. It speaks to the soul, in accents emphatic and clear, of possibilities and actualities, of comfort and quietude around the fireside and beneath the roof-tree, to be won by strong arms and willing hands, guided by a love for and knowledge of the farmer's vocation.

Conclusion and Review.

We have thus imperfectly and hastily glanced at the state of agricultural and mechanical industry of Waldo county. In doing so we have seen much to commend and some things to condemn. It would have been gratifying to have discussed as we went along the merits of each farm practice, but space forbade, and we have been content to photograph the passing views in a somewhat hasty manner. We have briefly presented the physical features of the county, her climatology, with illustrative tables, and her farming as it is. We have seen her husbandmen at home in the fields and observed their practice. We have seen her stock, and

orchards and farm buildings. These we have presented with no polishing of rough corners or varnishing of defects. And all this has been instructive, and from it we may learn lessons that may be of benefit. In a paragraph, we may sum up the advantages enjoyed by the county and also its defects. Then we may proceed to discuss each at length, if we will. Her advantages seem to be:

First, Proximity to the seaboard.
Second, Good natural grass soil.
Third, Abundant water power.
Fourth, Good organizations among farmers.
Fifth, Good dairy facilities.
Sixth, Good advantages for orcharding.
Seventh, Extensive sheep ranges.
Eighth, An enterprising, intelligent yeomanry.
Ninth, Good market facilities.
Tenth, Growing faith in farming.

Her disadavatages are not numerous or incurable, but are rather temporary and fast being overcome. They are:

First, Want of sufficient woodland.
Second, Growing too many potatoes.
Third, Going out west to mill.
Fourth, The selling of hay.
Fifth, Emigration.

These are the chief disadvantages, and are the parent of the rest or minor ones. We will consider consecutively some of the points raised and see what we can draw from them for consolation, for guidance and instruction.

Proximity to the seaboard, giving the advantage of cheap water transportation to and from her ports, the access to marine fertilizers and the healthy effect of sea air, on her climate. While some crops may do better in an interior situation, very many do best on the sea shore and under the mitigating influences of sea air. No inland transportation, except where large lakes and rivers are available, can compete with the cheap water communication enjoyed by maritime districts. It is a way that keeps itself constantly in repair, cannot be overcrowded, and admits of great competition and can never be monopolized in a free country. The waters that wash the shores are the nourisher of much cheap and healthful food in the shape of fish, clams, lobsters, &c., which

grow up without cultivation and cost only the gathering and marketing.

Good natural grass soil in abundance is another point of vantage. Beside our ponds and streams, between our hills, in our valleys, everywhere, are natural meadows, intervals, swales and flat lands, rich, deep and fertile. Many of our swells of land are moist of soil and rich in their composition, fostering a luxuriant growth of grass annually. Grass grows spontaneously and abundantly, so much so that there has sprung up the custom of selling it off in bulk, not waiting the slower method of converting it into beef, mutton, wool, butter, cheese and milk. Grass production underlies, permeates, controls the whole system of our agriculture. It is given the greatest breadth and looked to as the mainspring that keeps the farm machinery in motion. But important as it is and much as its claims are allowed, we must say they are not fully understood or appreciated. We must also say that not enough brain force—good calculation—is applied to producing it in the greatest abundance, of the best quality or curing it for hay in the best manner. Too much of our grass for hay gets too much matured, ripened, before cutting—too much is hurt by overdrying in a scorching sunshine and too much is damaged by dews and rains, which a few dollars' worth of cotton cloth made into hay-caps would largely prevent.

The wash of the buildings, of roads and pastures, can be turned over fields to advantage. There is profit which runs to waste in the rills that course unheeded by every roadside and on every farm. We have known fields whose produce has been doubled by judiciously spreading out in proper channels the road wash which was led and guided by an intelligent hand over those spots more sterile and unproductive. It is in this, one of the very many minutiæ of the successful farmer's operations, that we see the truth of the old proverb, "The diligent hand maketh rich."

We come now to consider the vantage which a large water-power gives the county—or would give it were it fully developed. If, beside our streams, where the wealth of power is lost in "idle dashings," rose the fair, gigantic mill, factory and shop, employment would be given to our young men and women, who now go to other places to seek the same work and wages that could here be given. We should retain and increase our population, make home markets for all sorts of country produce, at good prices, and all classes would enjoy prosperity thereby.

Nine-tenths of our population who go to other places outside of the county for employment, never return to live again within its borders. They carry out the vital wealth of any community—health and labor—and their places remain vacant. Go to Lewiston, Biddeford, Lawrence, Lowell, to the great West, to the Pacific slope—anywhere—and you will find plenty of Maine men and Maine women. They are a vast acquisition to the place of their adoption—a vast loss to their native place. To the country, as a whole, I admit that this change of locality is, perhaps, a gain, but it is an irreparable loss to the section that depopulates itself to build up another. When Waldo county has fully developed her resources of water-power, she will not only retain her increase of population, but she will attract some from other places. Skilled labor will be in demand and will be well paid.

In unison with their brethren of the West, at the present time, though not in so radical a degree, the farmers of Waldo county have been organizing, and have several comparatively good associations, though these organizations, as yet, have been more for consultation on farming topics, improvement and social intercourse, than for political or personal protection and advancement. Our brethren of the west are organized and organizing for protection against monopoly, for political equality and personal advantage. They have been driven to this, as it were, by the severe exactions of railroads in particular and monopolies of all kinds in general. We feel sure they will achieve the success so abundantly deserved.

Our chief organization is the Waldo County Farmers' Association. This is a deliberative body, having an oversight for the best interests of the county. Its constitution provides that all who attend its meetings are members. It has a president, three vice presidents, secretary and executive committee, which is composed of the secretaries of each and all farmers' clubs in the county. The topics for discussion are selected with reference to their timely application and practical needs. Generally, some one is appointed to open the discussion, and then it is given the widest limit of debate. The president is a man well fitted for the place, "instant in season and out of season." The secretary takes notes, writes out the most important parts of the discussion—facts and points of value—and causes it to be published in some paper largely circulated in the county. The meetings are monthly, except during July and August. We would urge other counties, who have not already done so, to forthwith organize and maintain a

county farmers' association, for improvement and social intercourse. They will find such an association of the grandest utility in pushing forward the material progress and prosperity of their several counties. We are glad to chronicle that Oxford, Franklin, Penobscot and Waldo each have initiated this good movement. Speed the time when Maine shall have in each county such an one, and sixteen instead of four shall be in operation.

The county agricultural societies are good institutions for giving an exhibition of results attained, but are cankered by that evil of our country—horse racing. We hope the time is rapidly approaching when purely agricultural fairs will be held, free from the immoralties of the turf. That trials of speed should be wholly rejected we are not fully convinced, but we can and should prune and confine them to the actually useful and shear them of all clinging vices of cruelty, gaming and dishonesty. The policy of giving half of the premiums offered to the one quality—speed —we loudly protest against. It leaves the premiums for the other more useful qualities of the horse and all other various departments of agricultural and mechanical production, shamefully small and comparatively insignificant.

Our farmers' clubs are a source of much good. They are the nurseries of agricultural improvement. The eight we have in Waldo county are live clubs and accomplishing much good, not only in their immediate vicinity, but their influence goes out all over the county, for good. There ought to be at least one in every town—twenty-six in the county—and several of the larger towns could well support two, uniting as one for holding their show and fair. We would recommend to all clubs, everywhere, to hold an annual fair. It will furnish an opportunity for showing what you have done and what you have, and also what your neighbors have done. It furnishes a gala day for the whole town and a day of enjoyment and sociability. You will go home more of a man, more of a determined, earnest farmer, strengthened and made better. Your wife and children will look to it as a bright spot in life's pathway, and the effect on the whole community, by these rural gatherings and merrymakings, will be good, grand and beautiful.

> "The barren wilderness shall smile,
> With sudden green and herbage crowned,
> And streams shall murmur all around."

No county in the State has better dairy facilities and hitherto

no county has stood at a much lower level. Cows have always been kept to some extent, much butter and considerable cheese produced, but it has always, except in isolated instances, been of the ordinary quality. Little attention has been given to breeding for milking qualities and it is rare to see good milking qualities transmitted for several generations in our neat stock. That we have many fine cows, good milkers, giving rich milk for butter or for cheese, is a fact; but it is also another fact, no less patent, that little dependence can be placed upon good "Native" cows for producing good milking daughters, under the present loose system of using scrub bulls and hap-hazard method of breeding. This ought not to be, and now that cheese making by associated effort is fairly inaugurated with us, we hope to see more attention paid to producing superior milkers. Cows have advanced in price already, and this will continue, under the demand that exists. A better and uniform article of cheese will be produced, which will command a good paying price. We are persuaded there will also be a good opening for butter makers, for prices of good butter can but advance everywhere. Our local markets must be better, since the withdrawal of so many cows from making butter, whose milk is used at the factories for cheese, will leave better openings for the sale of butter, and they will offer better prices to the producer of a good article. We have but little of the "gilt-edged" butter produced in Waldo county, and in fact but little of that which is real good. The bulk is low in quality, as well as in price. The best of pasturage, water and cheap fencing, point to our advantages. The necessity of making some change in our method of farming induces us to embark in dairying. Cheap transportation from our ports gives us vantage in marketing and the necessities of building up our farms urge us onward. We are confident the county will be found largely engaged in dairying by the expiration of the present decade. It must be so from force of circumstances. The course of events point to this conclusion. The best calves should be reared and an admixture of Ayrshire and Dutch blood be procured in those sections where cheese is to be the product made; and Jersey, Ayrshire, Dutch, Shorthorn and Hereford in those sections where butter and stock are to be the leading branches. The use of thoroughbred bulls with "Native" cows will give us animals nearly always partaking of many of the good qualities of both parents. The cost will be but little more

than that of using scrub bulls, whose calves are unfit often for any other purpose than to be killed for their rennet!

Attention should be turned to the breeding and selection of better dairy stock than we now have. Suppose we add to the value of our dairy products by this cheap and easy means one per cent. How much would it amount to? Let us see. We take the volume of last census report (1870) out of our vest pocket and hunt up statistics. On page 745, Waldo county we find produced in 1870, 876,494 pounds of butter and 31,386 pounds of cheese. Assuming the butter to be worth twenty-five cents a pound, it would be worth $219,126. One per cent. of this would be $2,191.91. If we increased the value ten per cent., it would be $21,912.20. The value of cheese may be put at sixteen cents per pound, which would be 31,386×16=$5,021.76. This added to the value of butter product would be, $219,126+$5,021.76=$224,-147.76. Ten per cent. would be $22,414+.

Good orchard lands yet unused and a good climate for maturing fruit, together with exemption from insect ravages to a large extent as compared with other parts of the country, point to the advantages we enjoy in this respect, and which should be made use of at once. Enough has been done in fruit culture to demonstrate its feasibility and profitableness, and this is almost all Waldo county should export—millions of bushels of the choicest winter fruits—cranberries and other small fruits. The Baldwin, Rhode Island Greening, Roxbury Russet and such standard varieties are particularly at home in the county, and may be raised with safety and profit. Black knot is the scourge of plum and cherry trees, yet is comparatively exempt in some towns. I am told by experienced fruit growers that the Black Tartarian and Gov. Wood cherries are exempt from black knot. Should this prove true in all cases, it would be worth much for fruit growers to know.

If we were asked the faults that are prominent in our orcharding, we should answer them under the general head of neglect. Neglect in selecting the proper site for an orchard, in selecting proper trees and varieties, in setting the trees, in keeping stock out while they are small, in properly mulching and manuring, in grafting, in pruning and in keeping insects from devastating. Neglect all the way through. This is the prominent fault with our orcharding; it is the general and the specific fault. But there are some noble exceptions.

Should we be asked how we would conduct an orchard, we should answer from painful experience and lessons learned by mistakes. We should begin right and keep right—that is, in our own estimation. In the first place we would select our site, and if not naturally of porous subsoil would put down drains enough to keep it dry as a garden should be. We would put the drains down two and a half to three feet, of tile or stone, made to last a lifetime. We next would plow the ground and incorporate old barn-yard manure, ashes, lime, plaster and wood mould enough with the soil to make it rich enough to bear a heavy crop of corn. The soil should be worked up thoroughly and fine. The holes should be dug as "big as the hind wheel of a coach," but not much deeper than six inches. We would dump a pile of several bushels of fine chip dirt, rich loam, &c., convenient to each hole and then go for our trees. We would go to the nearest nursery where a good stock was on hand and personally select the trees. We would have no scrubby, crotched or ill-formed ones. They should be straight, thrifty, vigorous, with evenly balanced, well set limbs, clean and having that "just right" look to them. We would have these or none, paying a fair price and having what we wanted. We would have them taken up carefully, put in a big box and kept covered with wet moss, hay and coarse cloth, taking them home and setting as soon as possible, as deep as they stood in the nursery and the same side to the north. In order to do this they should be marked before taking up, which can easily be done by attaching the label to a limb upon that side. We would spread out the roots evenly, having immersed them first in a tub of water to secure dampness, cut carefully every mangled root, pack the dirt carefully about each root and mixing in the loam and chip dirt before provided. When the roots were all placed, the dirt properly packed and the hole leveled up an inch or two higher than the surrounding surface, we would put on a mulch three inches deep of chip dirt, strong manure, old hay, decomposed leaves or straw. A very good mulch is made by mowing brakes as soon as large enough and packing them about the tree. We would keep the mulch over a space larger than a circle of the top of the tree. The following spring would dig in this mulch with a hoe and fork, replacing with new. The land we would seed to grass, cutting at the usual time, using some to lengthen out the mulching of the tree on the outer edge, the

rest dry for hay. We would not plow the land again, but keep a space about the tree, yearly widening its circle, rich, loose and well mulched. Would allow no stock to even *look* into that enclosure and would have delicious apples in plenty in ten years from the setting.

Care would have to be given each year in removing superfluous branches, destroying insects, putting mulch about in spring and raking it away from the trunk of the tree in late autumn to prevent mice sheltering beneath, in digging it in the following spring and in various other details which eternal vigilance, and a quick eye and ready hand would find to do.

If a few choice sheep could find no other pasture, it would be admissable to put a fence of laths or pickets about each tree and admit them to harvest the grass and leave their droppings. The lath fence could be built as follows: Drive four posts four feet apart, having the tree for the centre. The posts should be two feet above ground. Then nail on laths three inches apart, making a yard four feet square about the tree *sheep-tight.* This would prevent their "oiling" the trees, which is injurious, and also prevent their gnawing them "for the fun of it." Cotswold, Leicesters or South Downs, full-blooded, are *best* to pasture orchards with, and only such should be kept in Waldo county.

Our highlands, rocky hills and ledgy hill tops make the best of sheep ranges; the grasses that grow here are sweet, nutritious and fattening. The bushes and tender herbage are relished by the flocks and they thrive upon them. These highland pastures are not so well adapted to pasturing neat stock or horses. Cows do better on less broken lands and where there is a denser growth of grass, but sheep are particularly at home on mountain lands or hilly uplands.

Wool production can never be the chief object of sheep husbandry here. Mutton, especially lambs, commands a high price in our local markets or to send to Massachusetts. The raising of early lambs for market is very profitable and the wool one year with another from good ewes will pay their cost of keeping. Taking this view of the case, Merinoes are practically excluded, for they are a poor mutton breed. The South Down has had the preference in the county thus far, but Cotswolds and Leicesters are working in to considerable extent. Mr. S. F. Mansur of North Monroe has a flock of pure blood Oxford Downs,

bred by Charles H. Nealley, Esq., of South Monroe. These sheep give good satisfaction, are hardy, prolific, good mothers and shear a good fleece of middle wool.

There have been introduced by way of homeward bound ships from foreign ports, whose captains were somewhat interested in agriculture when at home, various breeds from different localities, which have left their mark on many flocks of Waldo county. One favorably received was locally known as the "No Eared" breed. The ears were entirely wanting, save the rudiments, which were covered by a lock of coarse wool. They had a singular appearance to the observer who saw them for the first time. Their wool was of medium texture; they were well wooled on legs and belly, hearty, good mothers and matured early. They were of medium size, well proportioned and plump. Another strain of blood, introduced from Italy, we believe, was known as the "Paddle Tails." They had wide, ungainly tails, somewhat like the beaver, were black, white and all intermediate colors and yielded very coarse wool. They were very prolific. They are now about extinct, the wool being too coarse for our home markets. They were a good mutton breed, if well fattened. Desirable qualities in any breed of sheep are quietness and peaceable as regards fences.

Good fences should always be found about sheep ranges, and this will tend to make sheep peacable. But any breed that is breachy naturally—that is uneasy of "metes and bounds," that dislikes confinement—is not a profitable breed. Aside from their breaking out of pasture now and then, they have less tendency to take on fat and keep in good condition than quiet flocks.

It is quite a general practice to feed mowing lands with sheep and cattle in the autumn. Some contend no harm arises from feeding with sheep, as they do not pack the ground to any extent, leave more than they get, if they have provender as they should, and top-dress the land more evenly than any other animal. President Jewett, of our County Farmers' Association, claims to have renovated several fields by autumn feeding with sheep, and doubled the product of hay on them. We have no doubt that a flock of sheep confined on a field immediately after haying up to the time of housing, liberally fed with grain, would greatly benefit the land, and possibly the cut of hay the following year, provided there was a good covering of snow during the intervening winter. "Sheep are the corner stone of good husbandry," and are one of

the four pillars of profitable farming—the whole being cows, sheep, poultry, bees.

An enterprising, intelligent yeomanry is the wealth, the support and the hope of any nation. There is good stock in that comprising the citizens of Waldo county. There is but little foreign element and the inhabitants are descendants principally of the early settlers which came from New Hampshire, Massachusetts and western Maine. They are men and women of sterling qualities and traits, trained to habits of economy and industry and enterprising in all matters of progress and reform. They are imbued with a natural shrewdness and caution, which turns to energy and *push* when the subject has proved worthy of encouragement.

Emigration of such men tends to bankrupt the community, and this is why we deplore their exodus. It is not the wealth of material value which we miss, but the wealth of brain, and muscle and energy. It is not so much the fact that there is less population, but that they have carried off some of the very foundations of our social and associated capital of vigor and strength.

Good market facilities, both by land and water, offer advantages for marketing at the best points the surplus of fold and field. The railroad and steamboat lines, the many coasters that ply in our waters and the county highways, all open up avenues of availability, which are used to fullest extent demanded by the exigencies of the times. These all combine to build up a growing faith in farming within our borders. Wet and dry, heat and cold, prosperous and unfruitful years have a tendency to discourage some and perhaps for the time being create distrust, but the sum total—the average of several years—and a better knowledge of other States, tends to develop a better, grander, deeper faith in farming in Maine, and our farmers turn to their labors with renewed zeal, born of hope and contentment.

They are more willing to learn, eager to improve, more liberal and social in their habits and life. There is manifest progress in the ranks of the classes of the farming community from year to year. There is a wearing down of the rougher aspects and points and more culture of mind and manner. We point to this as something grand and noble—something worthy of mention and that may well excite an honest pride in our yeomanry, bringing a cheerful outlook, with promise for the future.

We may ask what is the mainspring of this? What is its source? We answer:

In all ages wise men have been interested in agriculture. Much has been written upon the subject. Its merits have been celebrated in prose and in poetry, and to-day our greatest minds are still employing their talents in the study of the subject, and are giving to the world the results of their investigations. Surely agriculture is a science. To realize and to know that it is a science worthy of the most patient toil and effort, is the first step, well taken, on the part of him who would be a successful agriculturist. But, notwithstanding all that has been written in former times on the subject, and all that has been brought out by scientific investigation, the subject has not yet begun to be understood. Its different branches, the numerous elements that enter into it, and its various departments, render it one of the greatest and grandest subjects to which man ever turned his attention.

Farming is not an ignoble pursuit. Those countries in which agriculture is best understood, and carried on, are the most prosperous in every respect. Morals and intellect are there found to be of the highest order. The noblest and strongest men in our land are the farmers. Their sons are the hope of the country. In all practical affairs of State they will take the lead. The pale-faced city boys, have not, and will not, be able to compete in halls of legislation with the clear-headed, stalwart sons of the soil.

Our best scholars do not come from the cities, but from the farms. Men who are to-day doing the greatest amount of intellectual labor, have their farms, upon which they spend a portion of each day in vigorous employment. They are not ashamed of a brawny hand nor a sunburnt face.

There never was a time when there were so many aids to enable the farmer to become an expert in his profession, as now. Practical farmers are continually publishing works, setting forth the results of experimental investigation. Chemistry was never so well understood as now. Within the last fifty years wonderful progress has been made in that science. It has been put into the books in such a method that it can be easily understood. Our Agricultural Colleges have done a great work in training up men in agricultural science, who have given their attention to a scientific investigation of the soil, the best fertilizers, methods of preparing the ground for the different kinds of seed,

the manner of taking care of the plants when up to give the best results. To bring this about, science and experience have been united and have given wonderful results.

It has always been conceded that no one is so independent as the farmer; while others must fail and become bankrupt, the farmer will thrive; gold corners cannot ruin him. When sunshine and rain fail, then may the farmer fail, but not till then.

Farming is remunerative. Perhaps it will not, in a single day, pile up colossal fortunes, but it never fails to give a competence for old age, to the industrious. But the wealth of our land is after all in its farms. There are more farmers well off, and in comfortable circumstances in our land, than among any other class of people. And in fact it is, in the majority of cases, the best paying business. Scientific farming yields *great* profits. What we need is more of it. To cultivate a taste for it is to develop our land in material and solid prosperity.

We will glance briefly now, in conclusion, at some of the more prominent disadvantages under which the county labors, and perhaps point out some means for avoiding and overcoming them. The want of sufficient woodland, and in the proper places, first claims our attention. The early settlers pitched upon the hills and cleared them first, because the sun would have better access to their openings on hills than in valleys; second, because the uplands would bear corn and were more exempt from frost; third, the belief was prevalent that the lowlands were useless for farming purposes and good for nothing, except to hold the earth together; fourth, because these uplands were dryer and could be cleared more easily—as better burns could be obtained. They were productive and gave satisfaction to the pioneers by their abundant return of heavy crops. The settlers being on hills when roads were opened, they of course were laid over the hills to accommodate, and this accounts for so many of our hilly roads. The lowland was left for woods and waste places till nearly all the highland had been denuded of wood. Great rocky hills and spaces of broken land were stripped of lumber and then burned over or cleared, or partially so, for the few first crops that it would bear before its fertility was depleted and its sterility developed. Many of these tracts are now worthless for even sheep ranges and are growing up to bushes and woodland. This is as it ought to be, and every such hill and waste place should be put in wood as soon as possible. There is wood enough in the

county but it occupies the best land for grass and grazing generally. The woodlands now are principally in the valleys, beside the streams, ponds, and covering the natural meadow and interval lands. These are the richest grass lands now in the county, and by removing the growth, allowing the sunshine and atmospheric influences full access, would soon become fit for the production of the choice grasses. Every country highway should be an avenue of shade trees. They add much to the comfort of the traveller and to the prospect of the landscape. They add a money value to every farm and are the source of pleasure and profit.

Much of our woodland being in valleys and much of our highland being bald and destitute of trees, what woodland we have has less effect upon our local climate than it might have. It is as though the country was more destitute of trees than it really is. The highlands flood off and evaporate their surplus water quickly and the sun sooner parches their exposed surface. The valleys retain moisture longer, become more miasmatic and attract less from the atmosphere of its watery particles in time of drouth. Our woodland, from its situation, is not benefitting us as much as it should, agriculturally. Its wash goes away in streams or is held in the swamps, and is virtually locked up from the fields and pastures, which contribute to the woodland, rather than the woodland to them.

"Nature abhors a vacuüm." She clothes all with her livery of green and her robes of white. Her rain and sunshine, her sunlight and air circulate for all. She clothes the crag by pushing forward the hardy lichen to mat its surface and decompose its particles, forming by its decay and commingling with the rocky particles, a scanty soil in which some hardy tree or shrub may cling and grow. No place with any prentense of soil can be unfitted for some sort of vegetation. With a little judicious assistance from the hand of the farmer, all our waste places may be clothed with trees and made to contribute to the productiveness of neighboring lands and to the ameliorating of the climate, while their own growth gives profit for timber and fuel.

Potato raising has heretofore received a large share of attention in Waldo county. It has induced a slovenly method of farming and the running over large areas with light manuring. It has militated against wheat raising and narrowed the breadth of corn planted. Many have depended on growing potatoes for

sale, to buy their corn, flour, and pay their taxes, deeming it more profitable than to raise corn, and flour and stock to sell for ready money. This mistaken policy has prevailed too much and wrought fruits accordingly. Old pasture lands have been plowed up, potatoes planted on them, with no other dressing than a little plaster, superphosphate, &c., and these lands, after thus being skinned twice in as many years, seeded down to grass without a spoonful of barn manure being applied. Fields have been "potatoed" over and over again, with only light dressings of manure, till some of the light ridges "won't sprout white beans" and the grass roots are distant from each other as honest men are in this world. Not all our lands are thus run down, but thousands of acres in the aggregate are scattered all over the county in patches. Nearly every farm has a few acres of such—enough to show the evil effects of potato raising beyond the proper limits. The tops of the potato are rich in potash and should be buried at the time of digging, to prevent waste. A hoeful or two of dirt placed over them is easily and quickly done and causes them to rot quickly. The too prevalent practice is to leave them lying loose on the surface, where they are washed and wasted.

This wholesale attention to potato culture has got the farmers into the custom of "going out west to mill:"—that is, buying their corn and their flour. The sale of potatoes for these articles induces some needless costs and puts into the hands of the middlemen two articles from which to take toll—and they are experts in the tolling business—often leaving but little after the toll is taken. First the potatoes are sold to them, then the corn and flour bought, both at their own prices. By raising his own, the farmer saves going to market and saves the costly exchange rates. There is a difference of from fifteen to forty cents between Belfast and Boston prices on potatoes. Corn is worth from fifteen to twenty cents in farmers' cribs on the prairies of Illinois and eighty to ninety cents here in our local markets. These are the margins at present writing. Can the farmers of Maine afford to give these profits to the middlemen? Can the farmers of Waldo county afford to pay these tolls, for the sake of swapping potatoes for products they can raise just as well themselves? Flour worth three dollars to five dollars per barrel in St. Louis and nine dollars to twelve dollars in Maine markets. Maine can raise as many bushels of wheat to the acre as any western state and of just as good quality. This has been proved over and over

again, and the census proves it too. We are pleased to know that our farmers are turning attention more to raising wheat, convinced of its profitableness, and to avoid the toll exacted by the middlemen. They are finding that it is more profitable to go nearer home to mill than out west. They see that it is a poor make shift system where a coarse article like hay or potatoes is sold off in bulk and the finer products bought in return; and that they must change this policy if they would live and thrive.

The selling of hay is an evil that is hard to uproot. Its damaging influence is admitted on all sides, and the farmer admits its unthrifty practice while he goes on selling his hay. It is sad to see the long lines of the "Hay brigade" almost any day from autumn to spring on the roads leading to our ports. It is astonishing to view the vast piles of hay in bales in the store houses awaiting shipment. The only way we can see that it will be stopped is by turning the attention of the hay-sellers to some branch of farm industry by means of which the hay can be consumed at home on the farm, and that will yield more money and as quick return as selling the hay off in bulk. At present, only one branch seems to offer such inducements in full, and that is associated dairying. Now that it has gained a foothold in several places in the county, we shall expect to see hay-selling gradually becoming less frequent in practice, till it reaches a minimum position that it will we hope only be able to maintain in the future.

Perhaps hay might be raised near good markets, by a judicious system of repaying the soil by use of commercial fertilizers and use of city stable manure, night soil and sewerage, at a profit, while the lands were kept up to a high state of productiveness. But interior towns can never hope to thrive by this process, as the cost of transportation of hay and of fertilizers will eat up the profit of the lands, and the better situated lands will be enabled to compete with them to good advantage and profit. It seems a slow process to those used to selling hay to fall back to stock raising, sheep husbandry and a hard shift to engage in private dairying. By ridding dairying of the laborious part performed by the farmer's wife, by associated manufacture in factories, the objection to dairying is mostly removed. It seems to open up an avenue of promise, which is eagerly being taken hold of by our farmers.

The severe climate of our winters, the periodical drouths, and

the failure of the soil to respond generously under a slip-shod system of culture, has and still does induce many to seek the west and go in search of "baked figs," and they go out with their earthly dear ones and possessions to seek new homes in the "boundless west and sunny south." They find there some advantages over Maine, but a great many more disadvantages; but getting located they remain and are lost to the commonwealth of the old Pine Tree State. This emigration takes away many of our smartest men and women, who, not satisfied with the public spirit, energy and enterprise of their town, county and state, go to seek better in the west, if happily they may find it. Often the town is to blame for its close construction policy, that is after the "penny wise and pound foolish" kind. Often the "narrow gauge" policy is pursued, so very narrow that it drives out those men who would do immense good could they be retained by a common sense conduct of public affairs.

> "Ill fares the land, to hastening ills a prey,
> Where wealth accumulates and men decay:"

Especially if that wealth, as is often the case, is hoarded in coffers sunk from usefulness to the laboring man in bonds, banks and western railroad stocks. There is a class of men who pile up wealth and never use it for any public improvement or invest it in manufacturing enterprises, who are found opposing everything that looks to public weal when it does not reflect to them two to one or some other peculiar personal prosperity. How many such men would it take to upbuild a Lewiston or a Lawrence, to push on public improvements and social elevation, if social elevation cost anything in dollars and cents?

What any community wants to be vigorous, prosperous and happy is energetic men, who have its best interest at heart and have a cordial support from the community. Then, under their wise coöperation and guidance, the whole will thrive and grow, be peacable, quiet, orderly and offer inducements for other energetic men to locate in the midst, join their fortunes with theirs and help upbuild. This is what we want to see in every town in Waldo county, and then we shall see progress and prosperity.

In conclusion, we ask the lenient criticism of the reader. It has been our object to give a brief, succinct account of the agriculture and industry of our county; and we beg our mistakes to be overlooked and errors kindly corrected. Such as our work is

we present it, hoping we have labored not in vain in our efforts to cast abroad a better knowledge of the resources, capabilities and present prospects of Waldo county.

"Whoever thinks a faultless piece to see,
Thinks what ne'er was, nor is, nor e'er shall be.
In every work regard the writer's end,
Since none can compass more than they intend;
And if the means be just, the conduct true,
Applause, instead of trivial fault, is due."

CATTLE BREEDING IN ITS RELATIONS TO DAIRY FARMING.

With the increased attention which is now being given in our State to the manufacture of cheese by the associated or factory system—and which is full of promise for the future of our agriculture—greater interest should also be paid to the breeding of that class of stock which has decided merit and character for dairy purposes. The matter of breeding for specific purposes is now so well understood as to be very easily controlled, and we may breed for beef, for quantity of milk, or for butter, and in each instance get what we want. To assist our farmers in a better understanding of the principles of breeding in relation to dairy farming, it has been deemed best to present here an address upon this subject by Prof. William H. Brewer of the Sheffield Scientific School of Yale College, originally prepared for the American Dairymen's Association, and delivered at their meeting at Utica, New York, a few years since. Prof. Brewer is good authority on the subject, and the paper should receive the careful study of every farmer in Maine who is now engaged in, or who intends to become connected with a cheese factory association, or who is particularly interested in dairy farming.

"The special branch of American Agriculture which this Association represents, and in the interests of which it labors, presents such modern and new phases, that at first sight it seems more like a grand experiment than an established industry. In fact it is both. Still scarcely a dozen years old, and having the most of its growth within the last half of that period, it is as yet an experiment, if considered in its details; and yet its growth has been so rapid, already extending literally from New England to California, the amount of capital embarked in it is already so great, the production so large, and moreover being founded on such an eminently philosophical basis, that in one sense it is no longer an experiment, but a great established branch of industry,

destined to increase, and to continue from this time forward an important element in our agricultural resources, the future value of which we will not now attempt to estimate.

It seems a legitimate outgrowth of our modern civilization which tends more and more to the greater subdivision of labor and bringing into each special branch more science and more skill. This is in fact, applying to agriculture the same subdivision of aim and refinements of processes so necessary in manufacturing operations. If the manufacturer of cloth, or iron, will be most successful, he must avail himself of helps and suggestions from all available sources, or he falls behind in the strong competitive struggle, and so too, the dairy farmer has now his own special branch to work, and he must be equally enterprising, or he too will fall behind in the race. This is my apology for speaking at all before you, and for the subject I have chosen, "The Relation of Cattle Breeding to Dairy Farming." Never having had experience in dairy farming, I cannot interest you in the practical details of cheese making or the other details of a business requiring so much technical skill, which I do not possess, so I have chosen a theme, of importance to you, and one to which I have devoted more attention.

I have been the more impressed with the importance of the subject I have chosen since listening to the discussions to-day, where so much has been said about manufacturing *cheese*, and so little about manufacturing the *milk* from which the cheese in derived.

No single fact is better known, even to the mere boy upon the farm, than that there is a great difference in cows, as regards their value for producing milk, butter or cheese, and any business man would say that the first requisite for success in dairy farming would be to *have good cows for the business*, yet thus far I have hardly heard the subject alluded to here to-day, and I appeal to you, if it is not a fact, that this different value of cows, is one of the most important, yet most uncertain elements in your business.

This is not the place nor time to go into a history of horned cattle, nor of that of their various breeds—it is sufficient to merely state that cattle have been domesticated from the very earliest ages, and that they have been so changed and varied by breeding that it is impossible now to say when or where they were first domesticated, or from what species of wild animals they have been derived; whether all our various breeds of cows had in remote times a common ancestry in some wild species, or whether

several original wild species have become crossed and blended into the common stock which we now class as one species, varying so widely in its many breeds. Most naturalists have assumed a common ancestry in one species, breeders have as often assumed a diversity of origin for some of the more marked breeds, and now, some eminent naturalists side strongly with the breeders, and hold that several wild species contributed to make our cows what they are : I believe this myself. But however that may be, this much we know, that different breeds have existed from very remote times, at least as far back as the days of the patriarchs, and that these breeds were produced by selecting for successive generations such animals as were most useful to man or best pleased his fancy.

In the hour I have to address you, I propose to consider some of the general laws in stock breeding, to present facts bearing upon the general subject, and from these, show that for the proper development of the American dairy interest we need not only that more attention be paid to breeding our dairy cows, but that a special breed is needed, differing more or less from any we yet have. I shall use most of the time in presenting these facts, however discursive they may seem, in order to the better sustain and prove the conclusions they point to.

The term *breed* is often loosely applied, but I shall use it in its more technical meaning, a kind or race of animals in which the desirable qualities, or excellencies are transmitted from generation to generation with reasonable certainty.

When any species of wild animals is found in a state of nature distributed over but a limited area, the individuals resemble each other closely in most of their characters, they are nearly alike in size, in vigor, in color; in short, constitute but a single variety, at least they vary but little. But when a species is very wide spread in its distribution, then it is nearly always found in several varieties. What a naturalist calls a *variety* in nature, we call a *breed* in domestication, we may say then, that if any species of wild animals is distributed over merely a limited area, it generally exists as but one breed, but if a species is found spread over widely distant regions, it as generally is found in several breeds. The reason is plain. In different regions, the animals are subjected to different influences, the conditions of climate, food, enemies, vary, in fact a great number of influences come in to modify the conditions of life and health of the animal, and it slowly grows into a breed which will best stand the external conditions.

This is the great principle which underlies the theory of Darwin regarding species themselves as well as their varieties.

Let me illustrate by two examples, which are but partially suppositious cases. Horses were not found in America at the time of its discovery. Suppose that three centuries ago, horses of precisely the same breed had been turned loose to become wild on the pampas of South America, the plains of western North America, and upon some island. We will suppose furthermore that upon the island the forage was less abundant and there were no animals of prey to destroy the horses. In the three cases we would have different conditions, the forage would be different, the enemies or beasts of prey different. In North America, panthers and wolves would destroy the weaker ones and those less fleet, while the excessive drought would limit the forage at particular seasons. Thus from generation to generation the breed would slowly change, the fleeter ones would be preserved from the wolves, the more sagacious ones from the panthers, and the tougher ones during times of scant food, at which times the weaker ones would perish; in short, the fleet, sagacious and hardy animals would be preserved for breeders, and these would be the points which nature would breed to. We know the result, for our western wild horses, or mustangs, are a breed having these qualities in an eminent degree.

In South America some of these conditions are different, and we find a corresponding difference in the native breed. Upon the island supposed, the animals would become smaller, because of the more limited supply of food, and less fleet, because their preservation would not depend upon fleetness nor endurance. And, in fact, we find the horses of islands if not carefully bred by man, smaller than those on continents.

Precisely the same thing takes place with cattle, they have become wild in numerous regions, and in the different regions vary to meet the conditions, in fact, grow into breeds suited to their several localities.

But in certain characters they all vary from purely domestic cattle, they are more hardy, more fleet on foot, and smaller. But this last applies to *all* animals. *Without exception*, domestic animals (if long domesticated) are larger than the wild species from which they spring. This arises from their food, which man supplies more abundantly than they are apt to find in a wilderness.

But to return to domestic cattle. Among a half civilized people

it is desirable to combine in one animal a considerable variety of excellencies, without having any one of them very high, to have a hardy animal, tolerably good for work, and also tolerably good for milk and beef, but not having any one of these qualities in such an eminent degree as to impair the others. Superior excellence in one will not be obtained at the expense of another. Among such a people there will be a tolerable uniformity in the wants of the people, and in the means of their gratification, and this to a certain extent is the case in a new country among civilized people, where most of the farmers pursue a mixed system of farming.

But let the population become more dense, until agricultural labor tends to subdivision into classes, the same as other branches of industry do. With this, there comes in a greater variety of wants and some people acquire greater wealth to gratify their wants, competition also becomes more active. When some farmer from particular inclinations, or from interest, will set himself to breed superior cattle for these new uses, one will have cows that will yield more or richer milk, another better beef, and thus *breeds* will slowly spring up, from the fact that one place is better for the production of beef, another for milk, it is obvious that different breeds will spring up in different *localities*. This last fact I will dwell upon especially, as it is one I wish to strongly impress upon you, but we will consider it in connection with the other conditions that produce breeds, and determine their value.

I have spoken of the causes that produce varieties or breeds in nature, let us now look more into the conditions under which breeds are produced by man.

Of course, the primary cause is man's selecting the best animals for his use, but a great many elements enter into the problem to modify his operations—the food we may grow for the animals, the especial use he has for them, the markets, the condition of agriculture, the social habits and customs of the people, climate, diseases, injurious plants not grown for forage, insects; in fact, a great number of influences, some very slight, some very remote, but all enter into the complicated question, so that it is impossible for us to see or determine all the causes that have combined to produce the effects we see in our improved breeds.

To improve animals by breeding, up to a certain standard, is not a difficult matter, but to bring a breed up to a very high state of perfection requires a very strong incentive. At first sight, it seems strange that so much more has been done in improving

horses and sheep in this country than cattle. It is well known that American trotters, and improved American Merinos are celebrated the world over, and why have we not similarly improved American cows? Simply because individual breeders have not had the same incentive. At the last national census, there were more than twice as many head of neat cattle as there were of sheep, the whole value of which was of course many times greater, yet we have no truly American breeds of cattle, nor even American improved breeds that are celebrated, while the sheep are justly celebrated. The fact is just as apparent with horses, and the cause is the same. The individual incentive has not been so great. To explain,—certain sheep breeders have so improved their flocks that individual rams are valued at $10,000 to $15,000 for breeding purposes, and really sell for similarly large prices. This has grown out of the hopes induced at various times by fevers for speculative wool growing, but a similar condition has never existed with cattle. With horses, the enormous value of individual animals for racing purposes is the incentive. I have seen it stated that Flora Temple won for her owners, in four years, (over and above any losses,) $56,000. Nor is this an exceptional example. The annals of the turf abound in cases even more striking. It is published that the celebrated English stallion "King Herod," gained in prizes £201,505, (nearly a million of dollars,) and begat 497 winners. Every year we hear of individual horses winning over $50,000 for their owners. Now here is an incentive we can never expect to have in the case of cattle, but there are so many instructive features in it that I wish to dwell upon it a moment longer.

We find occasionally horses of mongrel stock that have great speed, and formerly there were many winners belonging to such stock. But by careful breeding, we have now the race of "thoroughbred" horses, bred up to a point of speed beyond that of the accidents. That has been brought about by carefully noting *all* the conditions within our control, and the immense profits of *winning* horses have been the incentive. And, remember, that on the race-course, it is the *little* superiority often that makes just the difference between a winner and loser. The difference of a *second* in speed, may greatly increase the value of an individual horse above that of a competitor who makes an average of a second longer time on the course. This slight difference of a second may decide which wins or loses the race, hence *every* point

in breeding that tends to get this additional speed is carefully noted. No such high incentive exists with cattle. A Durham bull that uniformly begets stock that is but a pound heavier than those begotten by his competitor, could not bring a correspondingly large price, yet excellency and weight of beef is what the Durhams are bred for. Recollect that we may improve any of the characters of stock by breeding to the point we desire; it is only necessary to have a sufficient incentive for so doing. Were the fashion to arise to run *oxen* on the course, to have a breed of racing cows, should the fancy of man or his cupidity take that form, I have no doubt that in due time we would have a breed of cattle nearly as fleet as horses, possibly as fleet. In fact, I am inclined to think that for a number of generations the ox would be a strong competitor. But what the ultimate limit would be in either case, we cannot now say. There must be a limit, and experience only can determine where nature has set her bounds, but it seems probable that in horses we have nearly reached that limit, I have no idea that the next two centuries will show any such increase of speed as the last two have.

But I have wandered from the theme—I was speaking of *incentive*, I will return again to the matter of *locality*. Let us first notice some facts regarding the cattle of Great Britain.

Tolerably well marked breeds date back there to a very early date, and in those early times, the breeds seem to have been purely local. In those days there was less intercourse among the people of different localities, we find the inhabitants still showing their old local habits in the various dialects spoken and customs that prevail. The wants as well as the customs of the people differed in these localities, the climate and forage differed, the markets differed, and hence, in improving their various breeds, each was so improved as to better meet the wants of its own locality. The presence of large landed estates, furnished farmers of wealth and intelligence who turned their attention to this, even when the mass of the people were indifferent.

In the several localities, by carefully *improving* the cattle of that locality, permanent breeds were established, which took the name of the locality. In all of these cases, it seems that there was earlier an admixture of the blood of several breeds, or at least varieties, as they then existed, but when a good strain had been established, then further admixture ceased and the breed formed was improved in its especially desirable characters. I shall refer

to this again after speaking of the characteristics of some of the breeds of Great Britain and the continent, to illustrate the points in my argument. It is unquestioned, that the introduction of the improved British breeds into this country has done much more to improve our stock than has resulted from the attempted improvement of our so-called "native" stock from itself.

This is especially true of the part played by Durham and Devon stock. First, the Short Horn Durham, which has done more to improve our cattle than any other breed, more money by far has been expended in importing superior animals, more praise has been used and more abuse applied to this breed in this country than perhaps on all other improved breeds combined. Many stock raisers, especially on the lands producing heavy grass, have been particularly loud in their praise, while others have been as loud in their abuse. Farmers tilling thinner soils and hilly lands object to them because they say the oxen are inferior to Devon for work, less docile, not so lively, more clumsy, &c. Dairy farmers have objected to them because they were not good milkers. Now, what are the facts of the case? How far is this true? What are Durham cattle and what were they bred for? Why, they originated on the richest pastures of Northeastern England and have been bred especially for *beef*. I need not tell you that English beef is unsurpassed in the world, and that Durham or its grades furnishes the best and most profitable of the beef of that country.

The most of the breeders of Durham stock have bred to this point, and so well have they succeeded, that in various regions and in nearly all lands where this breed has been introduced, it has improved the size of the cattle, the quality as well as quantity of beef; and further it has been abundantly proved, especially on rich pastures, that no other breed or their grades will furnish so much beef for a given quantity of food. The breed dates far back, and the short horns and beauty of form have been noted even for centuries, but the improvements in later times have been for *beef*. So eminently is this true that the milking qualities have been so neglected in certain strains that the cows scarcely have milk enough for their calves. Certain other strains however are better milkers, and in Durham grades there are many excellent milkers, but whether the highest type and most profitable type of beef cattle can be made to be correspondingly good milkers, I have many doubts. If however, we breed to the point of milk as well as beef, sacrificing a little of each for a greater excellence in

the other, we actually do get good milkers, and many men may be found who zealously defend the Durhams for their milking qualities.

And how is it with the Devons? This is a breed originating in the Southwestern part of England, on other pastures, and grown for other uses. They have another kind of beauty and have been bred for another kind of use. Not so large as the Durhams, thriving better on thinner soils and poorer forage, making active, docile, good working oxen, tolerably good milkers, in fact, more of an animal for all uses than the Durham, but inferior to it for certain special purposes in certain localities, the Devon breed, like the Durham, originated in a locality that made it the most profitable for that locality. A mixture of blood on the start, then improved for the locality until a breed was produced suited to the conditions of that locality, and admirably adapted for such other countries as have similar wants, and somewhat similar conditions. It is perhaps the best breed for the hilly portions of our country, but is not the best for getting the largest amount of beef from a given quantity of rich forage. The English farmer finds the Durham the best machine to transform his turnips and clover into beef, but it does not follow that this machine would be the best to transform the thinner pastures of eastern New York into milk. Nor does it follow that the Devon are better than the Durham for milk alone, but merely that on thinner pastures, experience has taught us that we can get more profit from them, in various ways, than we can get from Durham beef on the same pastures. From these two examples, taken from the opposite sides of England, the one from the Northeast, and the other from the Southwest of England, scarcely 300 miles apart, but differing in climate, soil, physical geography and markets, let us now turn to another breed from the same island.

On the western side of Scotland in the county of Ayr, its climate, soil, pastures, and the habits of the people are unlike those of the counties of Durham and Devon. From an early period the inhabitants bred more for *milk*.

At an early day there was an importation of Alderney stock, and the infusion of that blood in that of the breed of the region was one of the elements that helped in the improvement of the breed to what we now call the Ayrshire breed, so noted for its milking qualities. This infusion of Alderney blood improved the quality of the milk; the native stock lent it vigor, for it was thoroughly

acclimated, and possibly descended from the wild races of Scotland. I need not tell you what the excellencies of the Ayrshire breed are. It has been bred for *milk*, and for this purpose no one questions its value, but for the other uses to which we apply cattle, the production of beef, or as working oxen, it is inferior to the Devon or Durham. And it is so thoroughly established as a breed of milkers that it preserves it qualities when carried to other lands.

According to David Low, 600 to 800 gallons of milk per year per cow is not unusual, although he considered 600 gallons a good average, but this was many years ago, and the breed has improved since. In this country some extraordinary yields of milk have been stated which I will not here repeat.

In a recent French work a table is published from M. Rieffel, of the weight of certain cows and their yield of milk for one year. I will give a few examples:

Average weight of Cow during the year.	Wine Gallons of Milk for one year, from calving to calving.
1. 737 lbs.	607
2. 737 "	792
3. 1058 "	1004
4. 882 "	528
5. 750 "	634

It will be seen from this that in some cases the cow yields nearly nine times her weight of milk per year. I understand that the dairymen of this country consider 600 wine gallons of milk per year from a cow a big average, even when well fed for producing large quantities for sale. But the quality of the milk is much poorer in butter and cheese than the Ayrshire milk.

Here let me add, that I was told in France, that the Ayrshire was considered preferable to the Alderney for crossing with and improving the native stock for dairy purposes.

Let us now consider another breed, hardly British, and yet not continental, I refer to the Alderneys.

Off the northwestern corner of France, but near its coast, lies a group of rough and rocky islands, more French in their character than English, but belonging to the latter country. They are called the Channel Islands, of which the three principal ones are the islands of Guernsey, Jersey and Alderney. The latter is the smaller, but more especially gives its name to the breed of cattle that has grown up on that group. The islands are rather rough,

the climate mild but damp, and the agriculture quite unlike that of England, owing to a somewhat different system of land proprietorship. What causes led to the formation of a breed of cattle there, so renowned for their milking qualities, it is not the place here to enquire into; suffice it to say, that a breed has so sprung up, perhaps the most renowned in the world for their milking qualities, certainly so, if we consider the richness of their milk. The breed is small. I have before remarked that the domestic animals on islands are generally smaller than those upon continents. The pastures of the islands are not luxuriant, the feed is generally rather short, the yield (in tons) not large per acre, but it is very nutritious, and in that damp, mild climate, neither hot nor cold, the feed extends through the most or all of the year.

Under these conditions the breed has originated, and we know what it is. The milk is more celebrated for its richness, especially for making butter, than for its quantity. At Versailles, it was shown that milk from this breed yielded 6½ per cent. of butter. Many statistics have been published of the quantity of butter that has been made from individual animals. Sir Wm. Collings, of the Isle of Jersey, carefully observed the quantity of butter from one of his cows for two years, it amounted to 394 pounds per year. Mr. Priaulx has presented to a local agricultural society there, the statistics of his herd. Five cows for five years, yielded an average of 353 pounds per year, (160 killograms.) Many similar statistics might be given, but are unnecessary, and their real value is not apparent until we consider the small size of the cows, and the large amount of butter yielded in proportion to their food. In fact, this breed has been bred to *butter* rather than milk.

When this breed has been transferred to other lands, it has preserved its milking qualities, but for our climate, the recently imported animals are not quite hardy. They were reared in and for a milder climate. Their grades have become celebrated in all lands for milk and butter. Precisely as the Durham stock, when transported to other lands, and crossed with the native stock, has improved it in size, in form, and in fattening qualities, so the Alderneys have improved other stock in butter-yielding qualities. I have already stated that an early importation of this breed into Scotland had much to do with giving rise to the present Ayrshire breed, and also that in some places, the latter is now considered even more preferable for crossing for milk.

Let us now turn to some continental breeds, for on the continent may be found a larger number of breeds than in Great Britain, and although they have done little to directly improve our stock, yet they may here be considered with profit, for they help to illustrate my argument.

I have spoken of the Alderneys, and where they originated, on the islands off the coast of France.

If we pass over to the main land, south from these islands, and but a few miles distant, we enter the province of Brittany. This is called one of the poorest of France—rough and hilly, the soil thin, the pasturage scanty but nutritious. Here we have a breed of cows, known as the Brittany breed, and noted throughout France for their milking qualities. They are even smaller than the Alderney, but more hardy, yield similarly rich milk, and thrive well on these poor soils. M. Rieffel gives some statistics of the production of milk. I cite a few of the better cases.

	Average weight of Cow during the year.	Wine gallons of Milk for the year.
1.	595 lbs.	476
2.	661 "	450
3.	573 "	450
4.	584 "	370
5.	881 "	400

In this case, as in the case of the Alderneys, the period is from calving to calving. No. 5 is a cow bred more for form and size than for milk.

Cows of this breed are cited, which on their native hills, pastured on the scanty feed of the region, yield eight times their weight of milk per year. This breed doubtless had a common origin with the Alderneys, which they so much resemble, and which are bred so near by. Many attempts have been made to use these cows in other parts of Europe, but the experiments have not been eminently successful. They are a breed for poor lands, and will thrive where other breeds fail, but for the richer pastures of more favored regions, we can find better breeds, and indeed, in such localities this breed does not show to good advantage. Some say that they actually deteriorate. Speaking of them, Mr. Bodin says: *"the breed has been created on, and by the soil they occupy, and are only fit for lands which resemble these."* They have been used in France for crossing on other stock. I saw fine grades near Paris, which

were good milkers. By using some of this blood with some of the Durham, a cross has been obtained which some speak highly of.

Much has been said and written about the Swiss cattle, and this especially interests us, for Swiss cheese has a world-wide reputation.

Perhaps the most caracteristic feature of Switzerland and Tyrol are the upland pastures. These are the true *Alps*, for "Alps" means in those countries a mountain pasture, and not a snow-covered peak as we are apt to believe. The most of the region above 1800 feet, except the bare rock or eternal snow of the higher peaks, is occupied by these pastures. "The bright verdure of the meadows which clothed the slopes and valleys of Switzerland is one of the distinguishing features of the country; and the music of the cow-bells, borne along by the evening breeze, is one of the sweetest sounds that greet the traveler's ear." The villages are clustered in the valleys mostly below 4000 feet, but the cows are in summer driven as far up as they can find pasturage, following the retreating snow line as it melts, and are again driven towards the lower valleys by the early snows of autumn. These alpine pastures are very old, often centuries old, the yield is not large, the turf very compact, the grass short, fine, and exceedingly sweet and nutritious. When cut for hay it is wonderfully fragrant, the traveler in that country in the haying time, can often smell a village before he can see it, and the fragrance is the reverse of the smell of an American cheese factory. I do not think I exaggerate when I say that I have perceived the odor of hay stored in such a village, a half a mile distant. The most noted cheese regions lie at altitudes between 2000 and 4000 feet above the sea, that made at about 3000 feet has the best reputation. The people have followed these pastural pursuits for centuries, and breeds of cattle have sprung up under those special influences, in fact, they have been bred for cheese, as the Alderneys have been for butter. There are a number of sub-breeds, but the principal and perhaps best marked are known as the Bernese and Freibourg breeds, from the cantons where they are found in the greatest perfection and numbers. They are rather coarse looking cattle, lacking the beautiful symmetry of the better breeds of English cattle, are very hardy, not liable to disease, and thrive on pastures where the grass is so short that it seems, to an American, marvelous that they do not starve, even though the grass be of very nutritious kinds. They have been bred especially for milk, and for cheese. I have no statistics of the amount of cheese manufactured.

So many travelers have visited that country and so many have admired these cows for their valuable qualities, that of course they have often been transported to other districts. What has been the result? Generally failures. I am not aware that these cattle have contributed any considerable amount to the improvement of any of the breeds of cattle in the surrounding countries. I saw beautiful specimens of the Bernese cattle in Wurtemburg, not 200 miles distant, but in an entirely different region as regards altitude, pastures, and climate, and was informed that they had deteriorated in their milking qualities. It seems to be a fact, that they require the peculiar pastures, the pure air, pure water and rougher climate of their native land to preserve their excellencies. The same is stated to be the fact with all the truly Swiss breeds.

I will notice but one more example, a Tyrolese breed, known as the Zillerthal breed, from the valley of Zell. They are beautiful animals, symmetrical, in form reminding one of the short-horn Durham, but much smaller. They are the most beautiful and most noted cattle of Tyrol. They too do not preserve their excellencies when transported elsewhere, or at least are not as good for other localities as other well known breeds.*

Now what leading fact has run through all these cases? Why, that *breeds* are local in their origin, and almost as local in their excellencies. When we transport an improved breed to a region distant from where it originated, it must be to one similar to its home, if it would do equally well, otherwise they deteriorate, and that different localities as well as different uses, demand different breeds. Furthermore that it is impossible to combine in one breed all desired excellencies.

In the latest comprehensive work that I have seen on the breeds of cattle of Europe, (La Connaissance générale du Boeuf, par L. Moll et Eug. Gayot,) there are about fifty breeds mentioned and figures given, besides many sub-breeds. All of these have local names, showing how universal the localization of breeds is, at least in their origin. And I have shown how local some of them are in their uses, and were I to enumerate all of the breeds there described, we would find the most of them were as local in their uses, as in their origin, and find that but few of them were of any great value for improving cattle in localities distant from their home.

I have also shown how and why breeds or varieties are local in

* Another Tyrolese breed, that of *Simmenthal*, is less beautiful, but more noted for its milk, and has spread into Germany, where it is highly prized.

nature. These facts, so extensive in their occurrence, must not be ignored in profitable farming.

Let us therefore now consider the bearings of these facts upon the business of American Dairy Farming. Up to this time an incentive has not existed, sufficient to entice our stock raisers into making a breed suited especially to a particular use in a particular locality. But making cheese by the factory system creates such an inducement. The greatest expansion of the business is in a comparatively uniform region, on the pastures of eastern New York, or others similar to them. The capital embarked is sufficient to create a demand for such cattle. I have glanced over your last report and find that the 363 factories that returned the number of cows they operate upon, number about 170,000 cows. These represent a capital of over $30,000,000, (including land and buildings.) In the whole State it is vastly larger than this, for this is for but 363 factories. Here then is a business, employing this immense capital, in which the wants and requirements are precisely the same.

Heretofore we have needed the most of cattle for mixed farming, where the farmer would raise cattle for beef, work, or the dairy indiscriminately; but in fact, the price they would bring when sold for the city market, regulated and I can almost say, controlled the farmer's selection of breeding animals, but of the promiscuous lot, the better cows might be saved for his own or some one else's dairy. But how uncertain and how unsatisfactory has been the supply. I need not tell you that in getting cows for this especial business, all has been uncertainty. In some regions cows are bought from the west and tried—the majority prove poor milkers, and after the first or second year are fattened and sold to the butcher, the better ones are retained; and even then they must go through with a certain acclimization before they do satisfactorily well; others get from Canada with similar results.

If we keep these to breed from, there is still the same uncertainty. A good milker does not transmit her desired qualities to her calf.* She has not been bred for milk, and if she proves especially

* Since this lecture was delivered, one of the most intelligent dairymen of Connecticut has told me that he has kept a record of the produce of milk for every cow that he has owned for many years, and *in no case* under his own observatien, had a "native" or "mongrel" cow, which was an especially good milker, produce a calf which proved to be as good a milker as its mother. In the case of blooded stock, specially bred for milk, this was not the case upon the same farm.

excellent, this excellency is an accident, and such accidents are not usually transmitted, in fact, we know that they generally are *not* transmitted.

We need a new breed, or an old one improved on our own soil, under our special conditions, for this new use; and never will this branch of the dairy business be satisfactory and certain until we do this. It is what would be done, if it were any other manufacturing enterprise. But the want is even a wider one, it is as wide as the custom of keeping cows for milk, cheese, or butter. I mean, that the cheese factory system has furnished a proper *incentive*, and that the small dairy farmer may be profited by it.

Now, let us refer again to some of the improved breeds cited, for some other facts to guide us in this work. I have dwelt much upon the local origin of breeds, and have not finished with it yet, but let us consider some other conditions of their origin and improvement. The history of the Durham stock dates far back, and some authors claim that the breed contains much of the blood of a certain wild, native, short-horned species, but however that may be, several sub-breeds contributed to its early excellencies, and these excellencies have been magnified as it were in the improvements brought about by careful breeding. So too, the Ayrshires, descend from local breeds dating far back, which were improved on the one hand by an admixture of Durham blood, or of the sub-breeds which helped to produce the Durham, and also by an admixture of Alderney blood. These became engrafted upon and mingled with the hardy local stock, which was improved by the admixture, and finally a distinct and marked breed was the result, which has been improved to its present state. We too, have a so-called "native" stock, which although not truly native to the country, has been so long here that it is entirely acclimated to our climate, soil and pastures; it is, agriculturally speaking, a *native* stock. Now, how can we best arrive at the desired results I have spoken of? By using thoroughbred animals directly, by directly crossing thoroughbred cattle from different breeds, or by raising our native stock by a judicious admixture with the blood of milking breeds, and then improving these grades? It seems to me that the last is by far the best. The first case is impracticable because of its expense, and because we bring old breeds under new conditions in new localities. The second is impracticable, because it is impossible. By crossing two well marked and widely different breeds, and then breeding from the crosses, no one has yet

succeeded in obtaining an intermediate breed, permanent in character and combining the excellencies of each. All attempts to form a permanent and excellent breed in that way have been failures. After the crosses are a few generations removed from the original stocks, the animals are not uniform, and moreover, the poorer qualities of both original breeds are apt to appear rather than the good ones.

It is a fact similar to what we see in the amalgamation of strongly marked human races. We see this exemplified on a large scale in certain parts of Spanish America, but, more especially in Central America, where the white, black and indian races have been variously amalgamated for three centuries. The cross is not an uniform one, or even if it is, it is certainly not a high type of humanity. It is the common observation of all travelers that in those mixtures several generations removed from the original races, the meaner characters of humanity crop out in an eminent degree. And it is an equally well known fact, that in given families of such crosses, the children in the same family vary greatly, some resembling one race, others resembling the other race of the original ancestry.

This appears to be a law in nature. I will not discuss here whether or not an uniform race in the one case, or a uniform and excellent breed of domestic animals in the other, would result, if time enough were given, but this much is certain, it is not true for short periods.

In France, Durham and Ayrshire stock have been bred with their native cattle, and crosses obtained which are considered especially valuable for local uses, better than where foreign blood is exclusively depended upon. A cross of Durham, Ayrshire and Brittany is much prized.

A few words more and I have done. As I have said heretofore, a class of cattle, combining a larger range of qualities than for mere dairy use, has been the most profitable for the most of our farmers; hence to breed such cattle has been the principal aim. But now we need to specialize the breeds more. Let us keep in mind, that by skill *we may breed to any "point."* In horses, if we desire speed, we may breed for it, *and get it.* If endurance, or strength, we are equally certain of acquiring a reasonable amount of the desired excellency. I alluded earlier to sheep. Perhaps that illustrates the case even more marked. One man breeds for mutton, and South Downs are perfected. Another wishes combing

wool, and he gets it, even two feet long if desired. Another fine wool, and the fiber is diminished in size, until it vies with silk. Another, tolerably fine wool with a heavy fleece, and the Vermont improved Merino is the result. In certain places in Asia and Africa, sheep's tails are considered a great luxury, and there they breed to tails, until that appendage is made to weigh many pounds, I dare not say how many. One wants hornless sheep, and they are bred hornless. Another, a pair of horns, and he gets a pair of horns, while in some breeds, the animals have three, or even four or more horns. The animal seems almost as plastic in the hands of the intelligent breeder, as clay in the hands of the potter, and yet in another sense, his power is limited. He may get any of these desired results separate, *but he never gets many of them combined.* We breed for wool, but no one has ever succeeded in getting a breed producing wool of the fineness of the best Saxon, the weight of the Vermont Merino, the length of the Bakewell, nor the wool of the Merino with the carcasses that produce mutton like the Southdown. I am acquainted with the sheep-grower who took the prize for the finest wool at the first great London exhibition. He bred to fineness of fibre. He succeeded, but only by sacrificing everything else to that. His sheep grew more tender or effeminate, and the weight of fleece dwindled until it averaged but three-fourths of a pound per head, but he obtained fibre of marvelous fineness, *he bred for that, and he took the prize.* The Vermont Merino, yielding, I know not how much wool per head, descended from sheep imported into Connecticut, where the breed still exists in all its purity, but yielding less than half as much wool per head. The Vermont men bred to heavy fleeces, and they have got them. I might show that the influence of *locality* is even more potent with sheep than with cattle, however much certain breeders may dispute this. Men who have expensive sheep for sale, sometimes have their judgment warped by their interest, but experience shows that sheep of all breeds are very much influenced by their locality. I doubt if the Vermont Merinos ever could have been brought to their present condition in Texas.

I might carry this much farther, but it is unnecessary, and time forbids. So too, I might use up an hour with illustrations taken from any one of our domestic animals. I might cite dogs at length. One person breeds to speed, and the greyhound is the result; another to scent, and the bloodhound is produced; another for rat-catching, and the Scotch terrier is the result; another for

herding sheep and we have the shepherd's dog, and fancy or use have resulted in producing all these marvelous differences from the bull-dog who always fights to the shepherd's dog which never does, from the mastiff to the poodle—but, recollect, that each breed has only its own excellencies, we have no breed which fights equal to the bull-dog, runs as the greyhound, docile as the shepherd, and wise as the Newfoundland. We have our mongrel breed of dogs, (as we have our mongrel cattle,) having some of each of these qualities, but even the "yaller dog" excels in no one of his varied qualities.

But let us not lose sight of the main question—cattle for dairy use or for other uses. We may breed for beef, and get it; for quantity of milk and get it; for butter, and get it; we may breed cattle, best on rich pastures, or best on poor pastures. Let us breed for what we want, be it much milk, or be it for cheese.

But the experience of all eminent stock growers has been that it is impossible to get very diverse qualities combined in the same animal. The best race-horses are not the best for the plow, nor the best carriage-horses also the best for heavy teaming. Nor do I consider it any more probable that all the desired excellencies of cows can be combined in one breed. A breed that will be as active as the Devons, for working oxen, as large and easily fattened as the Durhams, yielding as big a mess of milk as Ayrshires, and as rich as the Alderney; an animal so wonderfully constituted that after serving a dozen years as a good working ox, or valuable milking cow, will then fatten easily as a young Durham grade, and finally ending its career by yielding a heavy weight of the tenderest, juciest, and best flavored beef, is simply an impossibility. This is asking too much of bovine nature, and if we would have the most profitable dairies, we must be content to sacrifice some of these other qualities in our cattle to that of excellent milk. We must have cows whose especial quality is to use the produce of our pastures and make it into the largest possible amount of milk, butter or cheese.

Much has been said here about the dairy business being overdone. I believe that in one sense is true, but not in another.

There is a sort of speculative *fever* now upon the subject of cheese making. Such fevers are not a novelty. I think we have heard of them before. There have been gold fevers, mining fevers of various kinds, and oil fevers. The rural population have not escaped. Now it is Merino sheep, and then it is Morus Multicaulis.

Why, we have even heard of a "Shanghai fever," and what is the result? The laws of political economy and rural economy have in the end decided the question, and will in this. Cheese making must be to a great extent a local business. Some localities will have advantages of soil, pasture, climate and markets that other places cannot have, and in such localities the business must and will prosper. The wide spread of the business will of course unsettle it for a time, but only for a time, for in those places where the climate or other conditions are against them, the business will prove unprofitable, and the favored places left in possession of the field. I never expect that the drier pastures of the West, as a whole, will successfully compete with eastern New York and similar localities, in cheese making, any more than I do that Massachusetts will stand as a rival to Illinois in wheat raising. The pastures and climate of this belt, seem by nature peculiarly adapted to dairy farming, and the quality of the products has already been tested and is well known. There may be particular localities in the west, and to some extent, south. where the business may prosper, but as a whole, I think this region has such eminent advantages over most others, that I believe that it must hold the supremacy. I need not tell you that any considerable increase in the heat of summer, will prove a most serious check, and I have no fears that any region much warmer in summer than this, will ever stand in serious rivalry with you for making cheese. It is certain, that the most of the cheese regions of the world have cooler summers than yours.

All these facts make me think that our climate, the nature of our pastures and their improvement with age, and the other advantages of position and natural features, that we here possess, place us in a position to keep and make profitable this great industry, and I have endeavored to point out one great desired improvement which I am convinced must and will follow, and the quicker it is consummated, the quicker the business will be on a firm and stable foundation. Then we shall have a race of cattle so especially adapted to our wants, that it will have its highest perfection in the very locality where it is of the greatest use, and be so completely adapted to our wants and locality, that the land will yield its full product of milk, butter and cheese. Then and not until then, will the business be in its most profitable condition."

REPORT OF THE AUTUMN MEETING.

In accordance with an advisory vote of the Board passed at its annual meeting, the semi-annual session was held at Houlton, Aroostook county, October 1st, 2d and 3d. The Board was very fully represented, nineteen members being present, together with a considerable number of prominent farmers from the older sections of the State. The farmers of Aroostook county were also out in full force—the North Aroostook Agricultural Society kindly postponing its exhibition at Presque Isle, which had previously been fixed for the same days. The presence of the students from the State College of Agriculture and the Mechanic Arts, not only added much interest to the meeting, but attracted the attention of the citizens of that portion of the State to the Institution in such a manner as will be productive of good. The meetings throughout were fully attended, the lectures and papers well received, and the discussions animated, interesting and profitable.

FIRST DAY.

The Board met at 10 o'clock, A. M., and was called to order by the President of the Board, Hon Warren Percival. After prayer by Rev. Mr. Herring, the address of welcome was given by Hon. J. C. MADIGAN, who spoke as follows:

Mr. President and Gentlemen of the Maine Board of Agriculture:

On me has devolved the agreeable duty of giving expression to the feelings which greet you, coming hither. And, in behalf of the citizens of our county, I extend to you a most cordial welcome; a welcome to our hearth-stones and our hearts. We regret, Mr. President, and gentlemen, that you could not see us at our best; that you had not been permitted to come among us ere chilling frosts had fallen upon us. As you go north, as we are happy to hear you are to do, you will see in traveling, if you feel inclined to travel 175 miles from where you now are, that we really deserve to be called the new Garden of Eden. We claim,

also, sir, that from your several counties we have taken, chosen for our own population, from among the choicest and best of your sons and daughters, those who had the courage, the energy, the intelligence to emigrate and come here. And as you go among them, you will be sure to receive that open-hearted hospitality, for which the citizens of Aroostook are so well known. Happy, also, are we to see with you the professors and students of the Maine State College of Agriculture and Mechanic Arts; a college which fills a need long felt, one, that to-day, enables a son of the humblest citizen of this State, to attain the education which in former years was granted only to the sons of the most opulent. The people's college is the college, which, in a no distant future is bound to accomplish wonders that have not yet been dreamed of.

Happy are we, also, to see with you the Hon. Sidney Perham; a man who deserves well of this State, for he has constantly labored to advance her morals and industries. But Mr. President, there is a precept taught in the common schools of our county, "never carry coals to Newcastle;" and it is the sentiment of my fellow-citizens, that it would be out of taste for me to attempt here, any learned disquisition. We have come here to hear *you* and these other gentlemen. We have come to sit under their teachings and yours, and my duty is done when I assure you, most gratefully shall we receive your instructions in the path of Agriculture; to assure you, that most gratefully do we thank you for the honor of this visit.

At the close of Mr. Madigan's address, a brief response followed by the President of the Board, in which he thanked the honorable gentleman, in behalf of the Board, for the generous welcome that had been extended. He was glad of an opportunity to visit Aroostook county, as were also all the members of the Board; and they came, not so much to instruct Aroostook farmers, as to be mutually benefitted by the conference, to discuss with their farmers interesting questions relating to our agricultural resources and prospects, to be refreshed physically and intellectually from this garden of the State, and to carry home bright sheaves of satisfaction to be cherished in all the future. He then introduced His Excellency Gov. PERHAM, who was received with loud applause, and spoke as follows:

Mr. President, Ladies and Gentlemen:

When I came into this hall a few minutes ago, I had not the least thought that I should be called upon to speak at this meeting. At least, I do so now, with some degree of diffidence, and certainly with no preparation for the duty. I wish, however, to assure you that it affords me no ordinary pleasure to be with you at this time, and I anticipate very great pleasure and profit in listening to the discussions that we expect to hear upon the topics pertaining to the great agricultural interests of our State. I have had for a great many years, a deep interest in the work which this Board of Agriculture is attempting to accomplish for the State of Maine. I had felt that interest in such an organization long before such an organization was formed.

I was in the habit, in my way, in those years from 1845 up to 1852 or 1853, when the first Board of Agriculture was organized, of discussing this subject with my neighbors and friends in public meetings and otherwise. And I had the honor of being a member of the first Board of Agriculture in this State, organized I think in the year 1853. Since that time, I have watched the proceedings of this Board, and I am satisfied that very great good has resulted from its efforts; from the discussions, and from the influence which has been disseminated upon the various topics discussed in all parts of the State. I am very glad to know that a portion of the meetings of this Board are to be held in different parts of the State.

I believe there is more advantages to be derived from these discussions held in different parts of the State, now in this place and next in another, than if they should be held exclusively in one place. The subject of agriculture has claimed my attention to some extent. In my earlier years, I devoted myself to that occupation and the very small sum I have to rely upon for the support of myself and family in my declining years was dug out of the sides of one of the rugged mountains in old Oxford county. From the opportunity I have had to associate with farmers of this State, from the stern necessity that was laid upon me to study every possible method of making agriculture successful, I have been of necessity interested in this great work. And I assure you gentlemen of this place, and also the gentleman who has so eloquently spoken for you on this occasion, that the welcome he has so well pronounced is heartily reciprocated on the part of those who have

come here to enjoy the privileges of this occasion. We have anticipated much, and I have no doubt our anticipations will be realized. You have spoken of the advantages of this county; called it the garden of Maine. Although the president is not prepared to acknowledge he has represented that truthfully, I am here to say he has not exaggerated in whatever he has said in this respect. I have had occasion to remark that you here in Aroostook county are able to show more good farming land altogether, than can be found anywhere else in New England, if not this side of the prairies of the West. Those of you who will have an opportunity of visiting other portions of the county before you return, will find that what I say is correct. It is the richest part of this section of the country. You only want railroads that shall come into your different localities, to develop your resources, to make Aroostook county the richest county in the State. And knowing and feeling that such resources are here, I have felt during the brief term of my administration, a special interest in the development of this portion of our beloved State. There are various questions which, I suppose, will be discussed on this occasion, pertaining to the interests of agriculture, and we hope to derive great profit from the remarks of men who have studied this subject scientifically, and from those who by their practical experience have learned what it is useful for people to know.

I will not anticipate, but there is one subject to which I wish to advert. I hear it remarked that farmers are troubled to keep their boys and girls at home; that just as soon as they get large enough, they want to go to Bangor, or Portland, or New York, or that they desire to go and try their success in the great West. This is true; and we, in the State of Maine, have felt especially the force of this. We have furnished a very large number of the best men and women that have gone out to people other States of this country, and especially the great West. A very large number of our boys and girls have left us, but we have this to rejoice over, and it is, that the men who have gone from Maine, have generally been successful; and, go where you will, wherever you find Maine men, you find the leading men of the place where they have located. This is a remark proper not only for us to make, but it is a remark made by people who have traveled in the Western country from all other States in the Union.

But referring to this habit of our young men of going away. You expect Bangor and other cities to derive great advantage

from the influx of the young men raised upon your farms. They look to Aroostook and other counties, for the boys who are to go there and take charge of all the real interests; and *now*, if you go into any of the cities, you will find that the men who lead in business and in the professions, the men doing most to sustain the interests of those cities, were boys raised among the rocks and valleys and obscure portions of this State. Now it seems to me there is some explanation why boys are not willing to remain upon the farm, though I have no doubt it would be better, if more of them were willing to remain. Is it not that in leaving the farm, they generally get more time for recreation and for improvement of their minds, than farmers' sons get? When the farmer boy, who is obliged to delve in the earth from five o'clock in the morning up to seven or eight at night, taking a short intermission for his meals, looks around and sees the sons of mechanics and professional men in the cities and villages obliged to work only half their time, and having better opportunities for recreation and education, it is not strange at all that he should be discontented. Now my idea is, if you are going to make a farmer's life desirable, going to make a boy feel that he can enjoy life and be as successful on the farm as elsewhere, you must give him some of the advantages he can get in other fields. You must give your boy the same opportunities for education and relaxation, that the boys engaged in other pursuits are in the habit of getting, and until this is effected, your boys will continue to go away as they have done in the past. This is a field, which it would be very interesting to discuss, but I forbear further remarks, feeling that I have already detained you longer than I ought.

Hon. A. M. Robinson, member of the Board from Piscataquis County, was next introduced, and addressed the meeting briefly. He said:

I shall make a very brief response to the call upon me on this occasion. I should decline it altogether, but for the fact, that I represent a belt of country akin to your famous belt section in Aroostook, and I think on this occasion I should exchange congratulations with the representative of your county. I am to make that exchange as representative of Piscataquis, with one of the leading distinguished men of your own county. We claim for Piscataquis, that it is one of the richest valleys of Maine, second to none in point of wealth of soil, although, to be sure, it has not

the breadth of the St. John and its tributaries, a bottom-land so rich and broad that it invites not only colonization from our own State, but stretches its broad arms across the ocean to meet a ready response to its promises from the labor and the population of the Old World. The State of Maine from time to time has done much, but sometimes very grudgingly, for the valley of the Aroostook. But a crisis occurred in the history of the State, which indicated the wisdom of the State in its appropriations to develop the agriculture of the "valley of the St. John." I refer to the hay famine. In that crisis, your county gave back to the State all it had received from the bounty of the State, and carried hope to the farmer and food to his starving herds. I came into this town last evening for the first time, and it has for me, of course, all the inspiration of novelty and freshness. I see abundant evidence of thrift, prosperity and grand, open-hearted hospitality; I need not say I am entirely pleased. We have brought in our train a variety of the industries of the State; a variety of its experience and talent. It is headed, as you see, by Governor Perham, not a governor of the carpet-bag persuasion, but a man of honor. Cradled in the agriculture of the State, he has never outgrown his cradle. I regret now, very much more than I did last September, that he is going out of office, and I hope his successor will be as true as he has been to the agricultural interests of the State. Then, gentlemen, we have a variety of practical men who are engaged in the various industries of the State, and intelligent enough to explain them. Then, we have the faculty and students of the Agricultural College, a faculty that is the peer of any other in the State, and a body of students superior to any other class in physical qualities, and equal to any in point of intellect and morals. We also have, what may be a novelty to some of the audience, two lady students. But I fear I am trespassing upon your patience, and hoping you will make this meeting a success, I will close my remarks.

At the close of Mr. Robinson's speech, the Hon. E. Payson made a brief and appropriate address, after which, President ALLEN, of the State College, being called upon, spoke as follows:

I too, would join in the response to the hearty welcome we have received in coming to this part of the State. I have often thought I would like to visit Aroostook, that I would like to come to

Houlton. I am glad I am here, and I feel pleased with this reception. As has been remarked by the President of the Board, we come representing not only different localities, from the lake and the river, from the ocean and the inland county, we come representing different interests. Our president may represent his herds, the member from Franklin may rejoice in his orchard, another may boast of his corn-fields; all have special interests, all have something they wish to present. The interest I represent in this great subject of the industrial resources of Maine, is not simply the herds or the flocks that are upon the thousand hills of our State, nor our fisheries, nor fruit, nor yet the products of the broad fields; but it is that which is nobler and better than all, and to which the gentleman has just now so eloquently alluded, when he speaks of the necessity of developing the highest interests of our State, in order to stop the drain of our young men and young women. As our Governor remarked, the reason why so many of our young men go abroad, is not simply because in other lands in other parts of the country, wealth can be more easily secured. That is not the only reason. I might say to one who has spoken on this occasion, why is it your profession is over-crowded by those who are almost starving for employment? Why is it the other professions which do not bestow wealth are so crowded? It is because they demand intellectual culture on the part of those who engage in them. They receive the respect of the community. It is mind that gives influence, intellect that commands respect. Men love respect as much as they love wealth. Nay, men squander their wealth for the sake of receiving the respect of others. Now, then, if the maxim is to prevail among farmers, that they are to educate their boys to be lawyers or doctors, or that any or no education is good enough for a farmer, then it is the farmer despises his calling. It is the farmer that throws contempt upon his noble calling, and then complains that they are looked down upon by others. Send off your best men to be educated for other professions, and keep your dull boys at home for the farm, and what is the result? Trained intellect will command respect, and wherever there is a class thus respected, then the young will crowd in, and they ought. In the establishment of these institutions which were founded by the General Government, the attempt has been made to elevate the industrial classes and give them equal advantages with professional men. I represent this interest, and I feel that I can point with pride to some of the

results which are already seen in our infant institution in our own State. It is not our experiment, it is a success. We feel that it is not in vain that the bounty of the State has been invoked to give reluctant aid to those prosecuting this great idea, that the people that are to engage in the active labors of life are entitled to just as good an education as they who are to engage in professional pursuits. The very thought is an inspiration to the young man who is to help develop the resources of Maine, to have the talent and education to command respect whatever be his employment.

Mr. President, I can only say in response to the warm welcome we have received, with greatful hearts do we accept this hospitality, and are glad we are here.

Ira C. Doe, Esq., of Saco, member of the Board from York county, and Daniel Stickney, Esq., of Presque Isle, followed in appropriate complimentary remarks, after which the meeting adjourned.

AFTERNOON SESSION.

The first exercise of the afternoon, was the examination of the junior class of the State College of Agriculture and the Mechanic Arts in the Elements of Agriculture, the exercise being conducted by Rev. Dr. ALLEN, President of the Institution. Following this was a paper on

BRAINS IN AGRICULTURE.

BY EDWARD PAYSON, MEMBER FROM CUMBERLAND COUNTY.

Human industry is as variegated, as the wants of man are numerous. It enters into every field, denying, in our own times almost fiercely, that any portion of the universe is too remote, or too intricate, or too grand, or too humble, for either its dainty handling, or its more heroic exploration. The burning sands of Africa, the Northern seas where the iceberg floats one-third of its huge bulk above the surface, and the illimitable ether, where worlds larger than our own keep on their stately march, alike invite its attention, and challenge its capacity.

But while the great whole thus includes this infinite variety, and is seen exhibiting itself under these manifold subdivisions, there is a more general classification, which arranges all this labor under two heads only. One of these includes everything that

involves the principle of life, and we call it organic. Under this head falls primarily, almost solely, the animal and the vegetable kingdoms. But there is more than this, and it is not altogether by a figure of speech that we include society, or civilization under the same head, since these too, rightly considered, are things that come into our hands by growth—by a process of living, and not by manufacture at all. We may flatter ourselves it can be done, we may try over and over again to do it, but we shall always find in the end, that society is a thing of growth, and so must be set down under that head denominated organic.

The other of these two general divisions is termed inorganic. It has to do with that vast field, into which the principle of life does not enter. Throughout the length of it, and the breadth of it, no heart throbs, no pulse beats, no muscle moves, no busy brain weaves its web of thought, no imagination rears its fairy structure, until its pinnacle towers up far away beyond the most remote star, and sparkles there in a light that has never yet come down to human vision. It has no life; neither feet to walk with, or hands to work with, or eyes to see with, or brain to think with. Only as it is capable of being worked upon, and is made subservient to man, has it any value. Beyond that, it is good for nothing, and so when we sometimes find a man, who by his inertness brings himself down to a level with the inorganic in nature, we say of him, he is a good-for-nothing man, as indeed he is, unless he wanders off to some land where cannibalism exists, and so becomes good to eat.

We have, then, two classes of objects—the organic, which includes every thing that involves the principle of life; the inorganic which includes everything that does not involve this principle.

But there is another division; there are two kinds of life. There is the mere animal and vegetable life, and altogether distinct from this, is life endowed with intelligence, and it is this intelligent life, which, working upon, or at least capable of working upon everything outside of it, confers upon everything outside of it, any value that belongs to it. True indeed it is, that intelligence is sometimes attributed to objects that have it not. We hear of laughing meadows, of whispering pines, of angry ocean, and the poet has given us the line which says, "from crag to crag leaps the live thunder." But all that is only said by a figure of speech, and the very lightning, or the principle of it, had to be worked upon by intelligent life—by the brain of man,

before it became his obedient messenger, to convey his errands almost as swiftly as thought flies itself.

This then being true, that intelligent life, or the brain of man, is the great efficient agent, by whose aid everything outside of it is converted to man's use, the question arises, whether this is less true in agriculture than it is in some other branches of industry, and if so, why? Or to put the question in a different form, is brain force applied to agricultural industries, with less promise of results, than when the same force is applied elsewhere?

And to answer this question, we must return to the distinction already alluded to, between the organic and the inorganic. The last-named, the inorganic, includes as we have seen already, all that immense field from which the principle of life is excluded; and as we cast our survey over this wide field, we find it thronged not only with busy, but with successful workers. We are fairly overwhelmed by the richness and the diversity of the gifts they shower so profusely upon us. The metallurgist, occupied with various ores; the chemist, busy among his retorts and crucibles with analyzing, compounding and manipulating salts, and earths, and alkalies, and acids; the astronomer, penetrating with his glass into regions where the imagination scarce follows him; the natural philosopher, investigating the great general laws, by which the universe is governed—all these and others like them, engaged in similar pursuits, enter this field with hopeful ardor, and come back from it with full hands, and flushed with the joy of triumph. Everything these inquirers have to deal with, is the subject of demonstrative proof. It is capable of experimental tests, that are not doubtful, but certain. The process in their hands advances by successive steps over ground that has been reduced into absolute possession. Each step in this process is distinctly visible. Each advance made is of known value. Nothing is left to conjecture, nothing that is done to-day, is to be reviewed and done over again to-morrow.

Turn we now to that other field, where the organic is the subject of investigation—where the principle of life enters into the question. How completely is all that has just been said reversed. An almost impenetrable mystery surrounds this subtle principle, which baffles the most patient study—sets at naught the most labored and minute research. And this is true in about an equal degree, whether animal or vegetable life be the object of inquiry, and is true also to a not less extent, when we turn our attention

to society and its laws and interests; because it, too, includes the principle of life.

And accordingly in the three great sciences of Medicine, Agriculture and Society, we find only the most meagre report of advance made. In the first-named, certain discoveries are reached doubtless, that alleviate human suffering, but no fundamental truths are brought to light by which, the length of human life is increased. In agricultural science, the same thing is substantially true, while in the science of society, who is not disgusted and chagrined as he recounts the numberless panaceas for its ailments, which one after another follow each other to their graves.

Nor is there the slightest reason for supposing that the case as here stated, will be greatly altered in the coming times. The laws that have been given to these two different classes of objects, will remain as they are to-day, and the inference is forced irresistibly upon us, that any very great advance in agriculture as a science, which has to do with the functions of living organism in the vegetable world, is no more to be looked for, than is a similar advance in medicine, whose duties are of a like kind in the animal world, or in social science, where the same difficulty must be encountered.

What then is the conclusion? Have brains, so effective elsewhere, no part or lot in the matter when agriculture is concerned? By no means. The view thus far presented, doubtless goes to illustrate the limitation of man's faculties, since we find such unequal degrees of success attending his labors, according as they are severally expended in different fields of industry. And this view, moreover, is unquestionably fatal to those romantic hopes and extravagant theories we sometimes meet with. But it teaches nothing like dispair. It gives no encouragement to unmanly croakings or lethargic indifference. It teaches us to strive for as possible, and to be content with as attainable, those lesser contributions—those more trifling advances, which by the very laws that belong to this class of objects, have been placed within our reach.

And this having been premised as to the inevitable restrictions under which brain force is placed in its application to agriculture, it remains to inquire, whether this force has not been curtailed by other causes that are not inevitable, but accidental, and so are capable of a remedy.

And it may be remarked that one mistake farmers make, is in supposing that brains work themselves, so to speak; that is to

say, if I may use a common expression, that they do not have to be put up to it. There are very many people who are not farmers—and it may be said here, that however we might be led to an opposite conclusion, by certain lectures delivered before, and by certain advice from time to time bestowed upon, our farmers, they are after all very much like other folks, and so far as I have had opportunity of observing, are constructed, soul and body, very much as other people are constructed,—I say there are very many people who are not farmers, who fall into this same error. They seem to think that brains, so that you once get them, will work of their own accord, and never need cudgelling, as a lazy horse does. But it has been *by* cudgelling, that brains for the most part have been made serviceable, and if the world had taken away from it, to-day, all that it has received by brain-cudgelling, it would find itself very poor indeed. It is of brains that it may be said more truly than of anything else, that the *law* of it *is* cudgelling; that is, there is nothing that will bear so much of it, with so little hurt, and nothing that so waits to *be* cudgelled, before it will yield up what we ask of it, as brains. A farmer's brains—any man's brains will no more work of themselves, than his shoulder will bear a burden of itself, or than his leg will jump of itself. Indeed of all things in this world to *shirk*, to put in excuses, to plead weaknesses, to cry baby—there is nothing like brains. They will lie there idle, doing absolutely nothing, if we will let them, and many a man, not among farmers only, performs a vast deal of leg-work, hand-work, and back-work, which he might be spared, if he would make that lazy brain of his do *its* part. On the whole, there is perhaps no mistake more universally committed, than the one I am now speaking of—that brains work of their own accord, without prompting, and thus it happens that in almost every town and every agricultural neighborhood, we find farmers, who, because their brains do *not* work of themselves, seem to conclude that they have got no brains, to speak of, or at all events, sooner than set them to work, sooner than compel themselves to so irksome a task as thinking a little, they will let a thing take its chance, trusting to their luck, or perhaps run after squire B, or some one of their neighbors, to see what *he* thinks about it.

Another error consists in supposing that brains come into play only on great occasions, when a certain magnificence belongs to the object sought for. To write a poem like the Odyssey, to produce dramas like those of Shakespeare, to rule over a great peo-

ple, or conduct mighty armies, to manage an intricate law case, to direct to a successful conclusion a work of engineering skill,—these, and others of a like sort, require brains forsooth, but outside of these brains are of little account.

But great works of this kind include only the most infinitesmal part of what brains are doing every day all around us, in the very humblest operations. If we could estimate the great aggregate of what brain force produces, we must go down into the simplest and plainest forms that human industry ever assumes. The forces at work in the *natural* world, arrests our *attention* chiefly, when they exhibit themselves in terrible convulsions that engulf cities, and the very foundations of the earth are shaken. But these are as nothing, when compared with the results of a more quiet and invisible working. The silent process of evaporation lifts greater weight into the air every day, than any volcanic action is equal to do. And so it is with brains,—by far the largest expenditure of them occurring in the every day routine of business, and in the ordering of our busy, perplexed lives. And in this, the more ordinary use of brain-force, no class of men have a deeper interest than farmers have, and no man gets a better return for brain labor, than the farmer gets, and it is to be feared that the absence of brain-labor, is frequently chargable with his failure to get on in the world. There are farmers not a few, who if the question were put to them would honestly admit, that they are not fond of brain-work—that they would rather thresh grain, or hoe potatoes, or dig drains, than do a little honest, downright thinking.

The truth is, there in no greater *waste* committed, the world over, than is seen in this neglect to put brains up to their proper work, in what we are prone to speak of as minor matters. The best of us are open to censure here, and we are constantly found doing things, or neglecting to do them, for no better reason in the world, than that we are too brain-lazy to bestow a little thought upon them, and so do them better. And so we can find, whichever way we turn, whole neighborhoods and large communities, so infected with, and so under the control of brain-laziness, that year in and year out, they fashion their lives after those about them, imitating even their weakness and their blunders, because it is too much trouble to set their own thoughts in motion. "It is only a small matter, and I'm not going to vex my brains about it, and I dare say it'll turn out all right in the end." This is very apt to be our language. We will travel a whole day, with a gravel-stone

in our shoe, rather than stop to inquire into the trouble, and so wag along, year after year repeating the same identical blunders, because we are too lazy to study out the cure. I have heard of a man, who when at night he went to remove the obnoxious gravel-stone, that had worried him all through the day, found it was a pair of snuffers. It is to be hoped that not many of us have reached a point of laziness like that.

Now if we could be made to see how much loss happens to the world in the aggregate, by this mental indolence, this unwillingness to be *bothered*, as we generally express it, in reference to these so called insignificant matters, we should probably be not a little surprised. And the farmer, quite as much as other people, but I imagine not more than other people, is open to this charge. He does not want to bother that brain of his. He is not ignorant of this infirmity altogether himself; is indeed often painfully reminded of it, and along about harvest-time, perhaps as early as mid-summer, he is often made to feel what a great loss might have been avoided by a very little brain-work only a few months before—that brain-work he so recoiled from, and now has to suffer for it—the mere fact, that at the time he "didn't think it signified much," not availing to save him from the penalty.

It falls not within the scope of these remarks, to consider at length, instances of the kind here alluded to. They are of constant occurrence, and of great variety. If a farmer has manure enough, or labor enough for only one acre, and spreads it over two acres, if he sows his seed upon a soil that is poisoned by surplus moisture held there for want of drainage, if he leaves his tillage covered with lumps as big as a cocoanut and almost as hard, he illustrates in all these ways, and in many other similar ones, what I am here saying.

Brains have been given to man for a great purpose, but that does not necessarily imply that they are always to be employed about what we are pleased to term great things; nor are great men the only people in the world who find it is a good thing to have brains, and who succeed in getting a profit out of them when they are set to work.

And having reached this point, I cannot forbear, either in justice to the subject or to the farmer himself, to introduce another topic intimately connected with, and so naturally suggested by, the last one. So far as my observation goes, there has been more readiness manifested by the friends of the farmer—and he has a

good many of them, as most people have, who are supposed to stand in need of advice—where money is the thing needed, this is not so uniformly true,—I say there is more readiness manifested by the friends of the farmer to take him to task for his shortcomings, than to inquire whether there be not some reason, and at least partial excuse for them. As I do not wish to bring myself within that category, and as I have just intimated an aversion on the part of the farmer, frequently, to downright, hard thinking, it is only proper to ask here, whether he is entirely without excuse, and the proposition may take a form like this,—that severe bodily labor is not consistent with the highest form of mental labor. Of course I am not now speaking of that proper degree of bodily exercise, which is necessary to the health of the body. But when that point is passed, whatever tax is imposed upon the body, is so much substracted from the power of the mind, and from the ease with which it works. The human system, it is true, is complex, or double, each part charged with its own specific duty. But the two parts of which it is composed are not independent one of the other, nor is it possible to exact from one of these parts all that *it* is capable of bestowing, and then in turn avail ourselves of the service of the other without loss. It is nothing less than an absurdity to assert that any man, after a day of severe bodily toil will find his mental resources undiminished by such toil of the body. And if the farmer who has given the best part of the day to his crops in the field, thinks to tax his system over again at night by mental labor, he will receive such return as men always do, who impose double burdens upon anything. Brains will insist upon fair play, and if they do not get fair play, all that cudgelling I spoke of will be of no more avail than cudgelling will atone to a horse for his want of oats.

So much then in extenuation of the charge, that farmers do not think enough. But after admitting this plea, and giving to it its full weight, it still remains true, that a farmer's brains have not been given to him for nothing. They are a part of his capital, and are capable of being made remunerative, far beyond probably what is happening all about us every day. It cannot be for a moment doubted, that after making those deductions which we must always make in speaking of human affairs, and so attributing some agency to what we term luck, that in proportion as brain-force has been applied to farmers, just in that proportion farming has been a success.

And let it be remarked in conclusion, that if agriculture as a science finds certain difficulties to contend with, growing out of the nature of the subjects it has to deal with, the same is true in an equal degree in some other departments, and if one of these difficulties is that of hitting upon experimental tests of absolute certainty, is there not reason to hope that the college which has been founded within a few years past in our State, shall count among the advantages it shall offer in the future, identically this one—that under its hands shall be produced, and through its hand shall be bestowed upon the State, these crucial tests in agriculture which are all the more needed, as they have hitherto eluded our grasp?

After the reading of the paper, President ALLEN spoke as follows:

When the old painter was asked, "With what do you mix your colors, to make them so beautiful and lasting in this great picture?" he replied, "I mix them with brains, sir." When the farmer, who paints his fields with the beautiful emerald of spring, and the harvest glowing in autumn, is asked, "with what he dresses his lands?" *he* might reply, "with brains, sir." It is the use of one's own brain, or the projects of other people's brains, that leads to success. To use other people's brains may lead the individual to what the world calls success; it is not always the individual inventor, or the original thinker that becomes the most wealthy, or that can secure the most productive results; that which the political economist calls productive wealth. But he has his reward, nobler, higher, and better. The individual who discovers principles, or invents means of applying them, is the world's benefactor, and other people make use of the results of his brain. But to most of us the great advantage is, we have a grand, noble opportunity of using the thoughts of others,—the work of their brains. No patent right, so to speak, is upon the grandest thoughts that ever swelled the human mind; no narrow restrictions prevent the utility of these great discoveries which benefit the world, and there is a generous and noble impulse within the thoughtful mind to communicate the wealth of its own intelligence, the results of its own investigations. The man of science hastens to unfold principles, and there are means and opportunities by which these are spread broad-cast over the world. Now, then, if an individual is not willing to "cudgel" his own

brains, let him at least be willing to take the results after patient thinkers have been cudgeling their brains, and the results are spread out before him. And yet there are those, having more obstinacy than brains, who will constantly persevere in the old routine, where there is no thought and where there is constant deterioration, rather than to receive that result which is the highest effort of the human mind.

Mr. BOARDMAN. I see before me an Aroostook county farmer, from whom I would like to hear some account of his farm and what he is doing; I refer to the member of the Board for this county.

Mr. PARKHURST, of Maysville. I do not know as I can say much of interest about my farming. I am not a scientific farmer, yet I have been much benefited by what I have read of other people's methods of farming. Whatever success I have had in farming and stock raising, I attribute largely to what I have derived from the study of agricultural reports and from the different agricultural papers I have read.

I think my new-land oats generally yield from fifty to sixty bushels per acre, occasionally sixty-five. The wood is wholly burned on the soil. On new land we sow mostly wheat; we get from twenty to twenty-five bushels to the acre. There is one of our Swedish settlers that had seven acres of winter wheat from which he harvested thirty bushels, machine measure, to the acre. I suppose our average crop of potatoes is 200, sometimes as high as 400 bushels per acre. Our clover seed varies very much in price and yield of seed; some years I have not got more than ten dollars an acre, other years seventy-five. Perhaps twenty dollars is the average of our Aroostook red clover; but I have been cultivating the Alsike and I get better returns from that. I prefer Alsike to any clover I have ever cultivated yet, although I would not recommend its use on light sandy or gravelly soil.

HIRAM STEVENS. I have done considerable in the way of removing the forest and subduing the soil. There is one thing that has been the secret of my farming success in some degree, and that is, to have my land prepared for a crop the *fall* before it is sowed in the spring. In one instance since I have been in this county I have harvested forty bushels of wheat from one acre of land prepared in this way. That was the best crop of wheat I ever harvested. From thirty acres I harvested an average of thirty-two bushels to the acre of the "White Bald" variety. The

process of clearing land in this county is as follows: The trees should be felled in the month of August and lie there until the next spring, when they are burned and cleared for a crop the following spring.

EVENING SESSION.

The Convention met at 7½ o'clock, President Percival in the chair. The lecture of the evening was on

The Agriculture of Maine in Relation to Other Industries.

BY PROF. M. C. FERNALD, OF THE MAINE STATE COLLEGE.

Mr. President, Ladies and Gentlemen:

It is hardly possible for me to express the pleasure I feel in returning, after an absence of seven years, to this village, and in marking the evidences of improvement made in that interval of time. It afforded me profound satisfaction this morning to visit again the scene of my former labors, and to see the improvement there, for the old academy building has been removed and a new and more commodious structure taken its place. It would have afforded me greater satisfaction to meet again all those who were wont to assemble there and respond to the roll-call; but I am saddened by the thought that many of them can never respond again upon earth, and to renew the cordial greetings and kind friendships not only with them but with the citizens of this village, which rendered my stay here of so pleasant a character that its memory has been sacred and precious. It would be entirely consonant with my own feelings to dwell upon the associations suggested by the past; but this hour and occasion demand another service at my hands, and to this service your attention is now invited, while I attempt to present some facts with respect to the agriculture of Maine in relation to her other industries.

The farmer sows in faith, and waters with the sweat of his brow his growing harvest. Whether from it when garnered, he shall realize more than a meagre subsistence, depends upon conditions not wholly beyond his control. It is true, he may not determine the character of the seasons, or control more than to a limited extent the force of nature, yet he *may* determine the relations of his own industry to the industries around him, so that every hour's labor shall bring an adequate recompense, or so that all his toil will fail to supply more than the most limited necessities of

life. A merely agricultural people can never become, in the highest sense of the term, a thrifty people. It is only in regions where diversified industries have their home, that agriculture is carried on with a degree of success and assumes an importance worthy of its name. In an article entitled "The Relations of Agriculture to other Industries," published in the report of the Department of Agriculture, 1871, an article to which indebtedness is acknowledged for many valuable facts contained in this paper, we read that "Mr. Caird, the highest British authority, in his work entitled English Agriculture in 1850-51, after carefully exploring thirty English counties, reports that in twelve northern counties which include the coal region, and the seat of mining and manufacturing enterprise, agricultural wages average 11s. 6d., ($2.79) a week while in eighteen southern counties, whose productive industries are greatly less diversified, agricultural wages are not above 8s. 5d., ($2.04)."

Thus it appears that manufacturing enterprises add 37 per cent. to the wages of the agricultural laborers of the northern countries as compared with those of the southern counties of England. The line of division, moreover, between the two sections, is distinctly drawn at the point where coal ceases to be found."

Fortunately, the question of wages in the same counties was very thoroughly investigated by Arthur Young, in 1770. Comparing the rates given by Young with those of 1850, Mr. Caird found that in a period of eight years, the compensation for agricultural labor had increased 66 per cent. in the northern counties, while in the southern counties the increase was but 14 per cent. He also found that the increase of wages was the greatest, in those towns which are the seats of the most extensive cotton and woolen manufactures.

The contrast presented by the increase in population, is not less significant. Lancashire* justly noted for its manufactures, in 1861 had a population of 1275 to the square mile. In 1871 the population had increased to 1479 to the square mile, a gain of 16 per cent. Wiltshire, † not favored with diversified industries, in 1861 had a population of 184 to the square mile; at the end of the decade, the increase of population had amounted to but 3 1-5 per cent.

Contrasts in wages and in population similar to those already

* Nearly 2,000 square miles in area.

† About 1,300 square miles in area.

cited from abroad, are furnished in all parts of the United States where lumbering, mining, commercial or manufacturing enterprises make a demand for laborers, as compared with sections of the country where such demand does not exist.

The point we particularly desire to make is, that where free competition exists, the compensation of labor is an index of value in productive industry; the higher wages being paid as the industries are more diversified, inasmuch as the labor itself is more remunerative to the capitalist, and must be more skillful in its character. In other words, "higher wages," as a general proposition, "mark and prove proportionally higher styles and services of industry," and hence that grand fact in political economy, "that only in advancing conditions of society can land and labor increase in value, and that all economic welfare depends upon their associated advancement."

In the most thriving condition of society, the farmer is not less dependent upon the manufacturer than the manufacturer upon the farmer, and only as their mutual interests are recognized and fostered, (those of the one by the other,) do they make real advancement. In our own State, the fact that the farmer's success is measured by the success of the machinist, the mechanic, the manufacturer, has been, in the past, only in a moderate degree, recognized. The disregard of this principle has borne its fruit and is bearing its fruit in the want of thrift, where thrift should abound, in low wages where labor should be well compensated; and it requires no effort of the imagination to conceive, that with the same policy pursued, it will continue to bear its fruit, to the end that our young men will still seek in other states, the rewards for skill of hand and labor of brain, which are denied them at home. The proposition that agriculture is dependent upon, and its advancement measured by, the diversification of all other related industries, as an abstract statement, needs no argument, but some illustration may serve to direct thought to it, and hence its discussion not be without practical value.

In savage states of society land has no value whatever; it belongs not more to one person than to another; it renders to man no higher service than to the wild beasts which roam over it. While this condition remains, there is but one kind of property, viz: personal property. From this fact has been derived a rule for determining the condition of society in all its grades, from the lowest state to the highest civilization. The rule is simply this:

"the proportion of fixed capital or real estate, to floating capital or personal property, held by any people, is the measure of its wealth and of its grade of civilization." Among savages, as before stated, real property does not exist. "In the highest civilization and greatest prosperity, real property preponderates, and its degree of excess over personal property, indicates and measures the national welfare." A striking example is furnished by the States lately in rebellion, as contrasted with the loyal States. According to the census of 1860, the real estate of the former was 43 per cent. and the personal property 57 per cent. of all their property, while the real estate of the latter was 66 per cent. and the personal 34. This difference indicates not more the material wealth, than the warlike strength of the two sections. Had not the Confederacy been conquered in the Federal treasury, it would not have been conquered in the field by four years' contest with the Federal armies. It is a noticeable fact, moreover, that the section where real estate predominates, came out of the conflict richer than before, while the section in which personal property predominates was beggared and ruined.

As previously stated, land in its primitive condition has no value. Its capabilities for the service of man are nothing so long as it lies in desert. It "derives *all*," or esentially *all* "its value from the labor bestowed upon its improvement, and that value is measured accurately by the quality and amount of the industries which are employed and reflected upon it."

Deducing the value of improved land from the cash value of the farms of the country, it appears from the census of 1870 that the improved lands of Nevada are valued at $16.03 per acre and the annual product is valued at $17.91. These lands are essentially in the state of nature, the productions of a single year representing a larger cash value than the lands themselves. In South Carolina, where a defective tillage has returned the land to nearly its primitive condition, the average value per acre is $14.88, and the annual product $13.91. The crop of a single year in this State is 9 3-5 per cent. of the cash value of the improved lands.

In the territory of Montana, improved lands on an average are valued at $8.61 per acre, while the crop of a single year has a value nearly 2 1-3 times as great as the value of the land which produces it. In New Mexico, land in farms is valued at $15.80 per acre, and the annual product 84.3 per cent. of this amount.

The average value of the annual products in the State of Maine was, by the census of 1870, 32.5 per cent. of the cash value of the improved lands. In New Hampshire, the rate was 27.9 per cent.; in Massachusetts, 27.6 per cent.; in Rhode Island, 22.1 per cent.; in Connecticut, 21.3 per cent.; in New York, 19.9 per cent.; in Pennsylvania 17.6 per cent.; in New Jersey, 16.6 per cent.; and in Alleghany County, Pennsylvania, rich in coal and iron, and rich in the manufactures, for which nature has furnished abundant material at hand, the rate is only 7.8 per cent.; land on an average throughout the county being valued at $193.25 per acre.

The writer has been informed that the lowest price at which land has been sold at auction in that part of the city of Boston burned over by the disastrous fire in the autumn of 1872, is $17.00 per square foot. A lot 30 feet front and 80 feet deep, at the lowest rate, costs no less than $40,800. The facts and figures just presented result from a fact that underlies and controls them.

That principle has been stated, viz: "land derives *all*, or *essentially all* its value from the quality and amount of the industries which are employed and reflected upon it." Good lands in the west are sold at $1.25 per acre, while an acre of land in the heart of Boston, at the lowest rate, costs the enormous sum of $740,520; and at the rate at which the writer is assured land in Boston has been sold, within the last year, an acre costs not less than two millions of dollars. It should be remembered that this is *land* simply, with no buildings upon it; but land covered deeply with the *debris* of a destructive conflagration. Why this enormous difference? Why government land in the west at $1.25 per acre, and land in an eastern city at two millions of dollars per acre? The answer is found by referring to the principle above enunciated.

In the one case the land is in the state of nature, unimproved by the hand of men, and unenhanced in value by any of his industries reflected upon it. In the other case, the labor of hand and brain of thousands upon thousands of men and women for more than two centuries has contributed to give the land value; a value not so much derived from the labor expended *upon it*, as from that expended *immediately around* it, and the industries reflected upon it from all sides. Roads have been constructed, bridges built, canals and railways have been made and school houses and churches and costly edifices have been erected. Manufactures, employing workmen of the highest skill, and vast warehouses,

have sprung into existence, such as two centuries ago were not only unknown on this continent, but not dreamed of in all the civilized world.

Besides all this, communication has been established by ships, by steamers, by telegraph, by railroads, with all parts of the continent, in fact, with all parts of the civilized world. Every item of labor expended upon all these has been concerned in giving value to the land so recently buried in ashes in the centre of that, in many respects, most fortunate city.

What has been said of the value of land in Boston, may equally well be said of every square foot of land in New York, in Philadelphia, in Paris, in London, in any other of the large and wealthy cities of the globe. What is true as regards value of land in the city, is equally true, only in a minor degree, of land in the country.

The causes which have contributed to the prosperity of Boston, and which have secured so high market value for real estate in that city, have also enhanced the value of every acre of land throughout the commonwealth of Massachusetts. Similar causes have produced, and are producing similar effects in every one of the States of the Union.

In the Monthly Report of the Department of Agriculture for March 1873, is a record of prices of farm lands in 1868 as compared with prices in 1860. From the extracts of correspondence subjoined to the table, we select a few statements:

"MASSACHUSETTS. Middlesex—suburban lands increase in value from the influence of increasing population. Bristol—farm lands, in the immediate vicinity of cities, are worth at the present time, double their price ten years ago."

"NEW YORK. Livingston—good farm lands in this county are worth $100 per acre; those near railroad stations often sell for $200 per acre. Ulster—land in this county has doubled in value since 1860, on account of our good markets, caused by manufactures, working quarries, and building railroads through the county."

"PENNSYLVANIA. Washington—farm lands are increasing in value slowly and steadily, by reason of improvements, both public and private. Mercer—farm lands are increasing in value; the causes of rise are large manufactories of iron, and large export of coal, and the facilities of five railroads traversing the county."

Given the productive industries of a State in all their diversity, and in their relations to one another, and it requires no prophet to predict what will be found to be the value of land in the State, the compensation made for labor and the condition of the State as regards emigation or immigration. Conversely the value of the improved lands of a State or large community, furnishes the means of determining within small limits of error, the relation of the industries to one another, and whether that diversity is secured, which is indispensable to high prosperity. In the light of this statement, how suggestive are the following figures, drawn from the Census Report of 1870:

Value of improved lands, per acre, in				Maine.....	$35 29
"	"	"	"	New Hampshire	34 52
"	"	"	"	Vermont... ...	45 35
"	"	"	"	Massachusetts.	67 06
"	"	"	"	Rhode Island..	74 65
"	"	"	"	Connecticut....	75 45
"	"	"	"	Delaware.....	66 91
"	"	"	"	New York.....	81 45
"	"	"	"	Pennsylvania...	90 61
"	"	"	"	*New Jersey...	130 29

The idea that "the original and indistructible powers of the soil" are of consequence in establishing the price of land, need not be conceded in this argument. This value, if it be a consideration, is so small in comparison with that which arises from the cause previously assigned, that for all practical purposes, it may be disregarded; while the fact, fully comprehended, that essentially the whole value of land arises from the labor bestowed, and the outside industries reflected upon it, demonstrates to the landowner that it is for his interest that a care for all such related industries form a part of his business policy.

We repeat, "the farmer is not less dependent upon the manufacturer, than the manufacurer upon the farmer, and only as their mutual interests are recognized and fostered, do they make real advancement." The farmer cannot afford to discourage such a diversification and such efficiency of all other productive indus-

* These States may properly be compared in illustrating the point under consideration, inasmuch as the list includes only New England and Middle States. Were the newer Western States and the Southern States included in the list, other conditions, not essential in the above comparison, would necessarily have to be taken into account.

tries, as his own depends upon for its prosperity. He is a short-sighted farmer who opposes the construction of a mill, because a few acres of his interval land will, in consequence, be overflowed with water; when the establishment of the mill will enhance the value of his property, and make a market for his products. That town adopts a wasteful and destructive policy, which refuses to exempt from taxation for a period of years, the capital, which invested upon its water privileges, would in ten years double, and perhaps quadruple the value of its real estate, and give encouragement and thrift and enterprise to its people. We may be permitted to advance the opinion that *that* State adopts at least a questionable policy, which refuses to towns the right to grant municipal aid to those enterprises which would keep her sons at home, develop her own resources, and secure to herself an abiding prosperity.

The census returns of 1870 reveal the effect upon population of the policy pursued in the several States. An examination of the results for the New England and Middle States is in point, and may well arrest the attention of every citizen interested in the welfare of the State in which he resides.

Table of representative population in the New England and the Middle States:

	1860.	1870.			
Maine.....	628,279	626,915	a loss of	0.22	per cent.
New Hampshire..	326,073	318,300	"	2.38	"
Vermont.....	315,098	330,551	a gain of	4.90	"
Massachusetts	1,231,066	1,457,351	"	18.38	"
Rhode Island.....	174,620	217,353	"	24.47	"
Connecticut.....	460,147	537,454	"	16.80	"
New York.....	3,880,735	4,382,759	"	12.94	"
New Jersey.....	672,027	906,096	"	34.83	"
Pennsylvania.....	2,906,215	3,521,951	"	21.19	"
Delaware.....	111,496	125,015	"	12.13	"

It is certainly a significant fact that during the decade preceding 1870, Maine and New Hampshire sustained an actual loss of population, while the other New England and Middle States made a gain on an average of 17.73 per cent.

An article published in the New Hampshire Statesman, early in 1872, accounts for the condition of that State as regards decadence of population and general prosperity, in a manner, suggest-

ive of the remedy, which is equally applicable to our own State. We quote from the article: "Why does New Hampshire now support a population of only 318,300; while Massachusetts has 1,457,351, Rhode Island 217,353, and Connecticut 537,534? Why has our population diminished nearly one to every square mile, in the past ten years; while that of Rhode Island during the same period has increased more than 31, that of Massachusetts more than 29, and that of connecticut more than 16, for every six hundred and forty acres of their territory?

"To one familiar with the course of legislation in New Hampshire during the period under consideration, the answers to these inquiries is obvious. About forty years ago, a new impulse was given to every branch of New England enterprise, by the introduction and construction of railroads, and the consequent development of manufacturing and mechanical industry. Up to that time, our citizens were almost exclusively engaged in agriculture and kindred pursuits. They were taught to believe that capital, especially associated capital was dangerous to liberty. They honestly thought the construction of railroads, and the erection and operation of manufacturing establishments by corporations, would demoralize the people and destroy the prosperity of a community of farmers. (Some of them perhaps foresaw that by cheapening transportation between New England and the fertile prairies of the West, railroads would bring our agriculture into competition with a new element against which it could not successfully contend in producing the great staples of wheat and corn.)

"Unfortunately, there was then at the head of the 'dominant party' in this State as its leaders, a set of men more ambitious for place and power, than to promote the steady growth and permanent prosperity of the Commonwealth. They availed themselves of the prejudices of the community and procured the adoption by the Legislature of a series of enactments, whose direct tendency was to prevent the investment of capital within our borders for any purpose. They insisted for a long series of years, that railroads were only private affairs, and that the right of way for them could only be obtained by the voluntary assent of the land owners. For ten years, they effectually prevented the construction of any railroads in the State, except a few for which charters had been obtained at an earlier date. At length, so obvious was it that we were being deprived of advantages to

which our position justly entitles us, and so strong had become the feeling against the policy which had so long interposed a successful barrier to the progress of improvement in New Hampshire, the leaders were compelled to devise at the November session, 1844, a plan whereby railroads might be deemed public, and there construction thereafter made practicable. But the legislation against corporations generally, designed to keep foreign capital out of the State, was continued until 1846, when the most obnoxious provisions were repealed and never afterward re-enacted. Meanwhile the money which built up Lawrence, and Saco and Biddeford, and many other places in Massachusetts and Maine, had been driven forever from New Hampshire, and no considerable improvement of our vast water power had been made except under charters long before granted. "For fourteen of the forty years, radical legislation prevented New Hampshire from engaging extensively in those branches of manufacturing and mechanical industry, the growth of which has peopled the vicinity of every waterfall in Massachusetts, Rhode Island and Connecticut, with a numerous, thrifty, intelligent and prosperous community. While demagogues here were denouncing capital, and successfully laboring to prevent its investment, the people of those states wisely encouraged the development of every form of manufacturing and mechanical industry, requiring the aid of capital, and the result is shown in the startling and significant facts to which we have alluded."

Is it not reasonable to assume that the same policy that has developed the material resources of those States, that has contributed to the wealth, to the increase of population, to all material advancement in Massachusetts, Rhode Island and Connecticut, may be made when applied in our own State, to check and turn back the tide of emigration, and give larger prosperity to all her people, by creating new and flourishing industries, which may employ at remunerative prices, the sons and daughters of Maine within her own borders?

The condition of Maine, in comparison with the other states, as regards manufactures, is shown, also by the late census. A few facts and figures compiled from the Report for 1870, will be of value in pointing out to us our true condition with reference to this great interest. Taking the aggregate of the United States, in 1850, the number of hands employed was, in round numbers, 957,000; in 1870, 2,054,000; the capital invested in 1850, was

$533,245,000, in 1870, $2,118,208,000; the products in 1850, amounted to $1,019,100,000, in 1860 to $1,885,861,776, and in 1870, they had risen to the enormous sum of $4,232,325,442. The total expension of this interest for the decade ending in 1870, as exhibited by the increased products, was 124 per cent. The greatest development of manufactures was in the Eastern and Middle States; the greatest proportional development was naturally in the Western States, of which Missouri holds the first place, showing an increase of 400 per cent.; Maine shows a growth of 109 per cent.; Connecticut, a little less than 100 per cent.; Massachusetts, 116 per cent.; Rhode Island, 173 per cent.; New York, something over 100 per cent.; and Pennsylvania, 140 per cent. The position of the New England States with reference to manufacturing, is more definitely shown in the following table:

	Hands Employed.		Capital.		Product.	
	1860.	1870.	1860.	1870.	1860.	1847.
Maine,	34,619	49,180	$22,044,020	$39,796,190	$38,193,254	$79,497,521
N. H.,	32,340	40,783	23,274,094	36,023,743	37,588,453	71,038,249
Vermont,	10,497	18,686	9,498,617	20,329,637	14,637,807	32,184,606
Mass.,	217,421	279,380	132,792,327	234,877,862	255,545,922	553,912,568
R. I.,	32,490	49,417	24,278,295	66,557,322	46,711,296	111,418,354
Conn.,	64,469	89,523	45,590,430	95,281,278	81,924,555	161,065,474

The rate of increase of manufactures in Maine for the decade under notice, compares not unfavorably with the rate of increase in the other New England States; but it should be observed, that a gain in manufactured products of 110 per cent. in Maine, is represented by an amount of only about $80,000,000, while a gain of 110 per cent. in Massachusetts, is represented by more than $550,000,000. With our unparalleled water power, inviting the investment of capital, and with the fine sites furnished by our rivers, for the home of varied and lucrative industries, it may safely be said that we have now invested for manufacturing purposes, only a small fraction of the capital which we can profitably employ, and which is so imperatively necessary to the development of our resources, and a proper economy in the use of the forces which nature has placed at our disposal, and which are now running to waste.

Walter Wells, Esq., of Portland, than whom no better authority concerning our water power and the facilities it furnishes for manufactures can be quoted, said early in 1870, "we ought to have $120,000,000 of the capital" (invested for manufacturing purposes,) "laid down upon our waters, employing 200,000

operatives, and producing $200,000,000 in value per annum. We cannot do too much; 1,500,000 square miles of productive national domain look to the East for the grand staples of manufactured goods; the demands of the interior will outstrip us, do what we may."

The same gentleman, in a letter from Boston bearing date February 10, 1870, to the Kennebec Journal, indicates what it is needful that Maine or her citizens shall do, to secure the investment of capital on the water declivities of the State. He writes: "We are all agreed that what Maine needs, is not so much population as capital. With a view to attract capital we are now making known our extraordinary natural facilities for manufacturing. * * * For the last three months, I have been brought into very frequent contact with manufacturers in Massachusetts and other States. Almost the first thing one discovers in conversing with these men is their deep sense, born of observation and long experience, of the immense benefit conferred to any place by judiciously invested manufacturing capital in it. Correlative to this, is the conviction that to secure the investment of capital therein, towns or states should be willing to make liberal advances. They feel that municipalities or their citizens, should meet the capitalist half way. In fact, little capital now finds investment in untried localities, that is not met half way. In the future, still less will be; there will be no exception in favor of Maine. It is not enough that we show them unequalled motive power. Power is not all; sites are to be purchased, dams and canals are to be constructed, buildings erected, machinery procured, stock and supplies laid in, skilled labor secured, and this costs ready money. For investment upon much inferior privileges in the old manufacturing states, capital can be had in abundance, in the immediate localities from interested property-holders. The manufacturer joins his money with theirs, and the enterprise goes forward. We must do the same; we shall have to wait indefinitely unless we do the same." In the same letter, alluding to the city of Augusta, which it will be remembered, adopted the heroic policy of voting aid to the enterprise of the capitalist and exempted his investment from taxation for a period of years, he says, "Augusta, with her changed prospects, is worth a million dollars more than she would be but for the Sprague purchase. Already she has her money back and three hundred per cent. added."

In the "Water Power of Maine," published in 1869, we learn that at that time, the city of Lewiston contained fifteen manufacturing companies, with an invested capital of $5,000,000, employing 5,324 operatives and a motive power of 4,166 horse powers, driving 33 water wheels and 220,000 spindles, and furnishing an annual product of 28,409,344 yards of cotton cloth, 451,155 yards of woolen cloth, and 3,033,423 grain bags, requiring the use of 1,679,281 pounds of jute; that Lewiston had a population of 13,000, a valuation of $5,500,000, that the number of churches was 7, the number of schoolhouses 27, number of schools 38, and the expenditures for school purposes for one year, (1866-7) was $53,278.58. We learn, moreover, that in 1850, when operations commenced for the improvement of the power, the population was only about 4,000 and the total valuation $625,596. In a period of less than twenty years, the population had increased 225 per cent. and the valuation nearly 780 per cent. It is further added: "it is not presumed that the growth of the city has, by any means, reached the limit due to even the present improvement of the power; but even at its present stage it strikingly illustrates the rapidity with which water power when adequately improved, under favorable conditions, accumulates wealth and augments population. If all the available lake surfaces of the Androscoggin were as thoroughly improved as those of the Merrimac now are, the population of the city would probably go up to over 40,000, and with Auburn which is divided from Lewiston only by the Androscoggin, would probably reach at least 50,000."

The case of Lewiston, although not an exceptional one, admirably illustrates the advantages growing out of a liberal and progressive business policy. The writer has been informed (possibly without sufficient foundation for the statement,) that had the town of Milo at a certain time, adopted the heroic policy which the city of Augusta subsequently adopted, or had she given needful encouragement to capitalists, through the liberality of her citizens, the capital which found investment on the Androscoggin and which has contributed materially to the upbuilding of the city of Lewiston, and has enhanced the value of every acre of land within a radius of twenty miles of that city, might have found investment on the Piscataquis, and the village of Milo, to day, might vie in wealth, in population, in material industries with that most thriving city, and every land-owner in the Piscataquis valley rejoice in the augmented value of every acre of land he possesses.

The writer has also been informed that had the town of Orono, at a certain time, adopted a similar progressive policy, the capital now invested on the Merrimac at Lawrence,* Massachusetts, and which has been an essential agent in the building up of a flourishing and wealthy city, with a population of 32,000 inhabitants, might have been invested on the Penobscot, and the magnificent water power at the Basin Mills in Orono, might be utilized much more nearly than now, to the extent of its capacity, in driving 200,000 spindles for the manufacture of cotton and woolen goods, and the town of three thousand inhabitants might rejoice, instead, in a population of ten or twenty thousand.

These are lost opportunities and cannot now be recalled; the lessons they teach, however, should not be unheeded. As a people, we are doubtless learning that in order to secure the investment of capital within our State and the consequent development of our home resources, it is needful that we set aside all petty policies and meet capitalists in a spirit, at least as liberal as their own; and when we have thoroughly learned the lesson and act upon its teachings, we may hope in a measure to redeem the past, and build up sure guarantees of enlarged prosperity for the future.

The general proposition that agriculture is dependent upon and its advancement measured by the diversification of all other related industries, has been, perhaps, sufficiently illustrated. The diversification of productive pursuits, however, which most concerns

* The following statistics kindly furnished by Hiram F. Mills, C. E., of Lawrence, Mass., will be read with interest. In a note accompanying them, Mr. Mills thus refers to the rapid growth of the city: "You will see that from a few scattered farm-houses, containing perhaps 100 persons in 1845, the development of the water power, and its use in manufacturing, has caused a city of 32,000 persons to exist in twenty-seven years, and the city is still growing and what is still better, is made up of a very thrifty, industrious and intelligent people."

Statistics of Lawrence, Mass., (compiled from official sources.)

	Population.	Valuation.
1845	100	$225,000
1850	8,283	5,902,741
1855	16,081	9,954,041
1860	17,669	10,584,023
1865	21,723	12,783,273
1870	28,932	17,412,500
1872	32,000	18,500,000

The number of ratable polls in 1845 was 23, in 1871, 6,625; the number of churches is 20; of school houses, 18; schools, 37; scholars, 3,628; expenditures in 1871 for school purposes, $72,000.

the farmer is that which is immediately around him, that which is within the sphere of his own business relations. His own welfare requires that there shall be a demand for the products of his farm in the largest amount which he can supply. And just here should be considered the advantages of a home market over a foreign market. To all producers in the United States, a market across the Atlantic is about equally accessible, and for such products as admit of distant transportation, every farmer has a rival in every other, engaged in raising the same productions. No State in the Union is practically nearer our only European wheat market than is every wheat growing country in the world; and hence the inconstant and unreliable demand in Great Britain for American wheat and the varying price* it commands in that market. The quantity of wheat and flour imported into Great Britain from the United States has varied in the space of ten years, from 28,000,000 bushels in one year, to 7,750,000 bushels in another. A home market is essentially exempt from such fluctuations, and moreover the most valuable and remunerative agricultural products do not admit of transportation beyond seas, but are limited in transportation to inconsiderable distances. A neighborhood market for such articles as potatoes, cabbages, turnips, beets, all market garden vegetables, poultry, veal, mutton, milk, berries, eggs, and fresh butter, makes the difference between remunerative prices for the farmer and prices with the profits deducted to pay charges of transportation. Such a neighborhood, or home market can only be sustained by a complete diversification of productive industries. A farmer has nothing to exchange with a brother farmer, for neither has what the other wants; but he can make exchanges with the merchant, the tailor, the carpenter, the blacksmith, the shoemaker, and a neighboring factory will make a demand for his most remunerative products.

The farmer should remember, moreover, that the chances of realizing the year's expectations are increased in proportion to the demand for a wide range of vegetable products. Such a demand is possible only in the vicinity of large communities, devoted to a variety of pursuits, with the commerce that necessarily attends multiplied productive industries.

* For 1863 the average price per imperial quarter (8 bushels) was 44*s.* 9*d.*; for 1864, 40*s.* 2*d.*; for 1865, 41*s.* 10*d.*; for 1866, before October, 49*s.* 11*d.*; after October, 62*s.* 1*d.*; for 1867, 64*s.* 6*d*; for 1868, 63*s.* 9*d.*; for 1869, 48*s.* 2*d.*; for 1870, 46*s.* 11*d.*—*Commodore M. F. Maury.*

It has been stated that the manufactured products of the country in 1870, amounted to the enormous sum of $4,232,325,442. What share has the agriculturist in this grand total of manufactured commodities? He has furnished, and it is no inconsiderable item, all the material of our domestic textile fabrics. Making an estimate which statistics of previous years would justify, at least four-fifths of all the raw material which enters into our manufactories are derived from the farms of the North and the plantations of the South.

From all this will be perceived the close inter-dependence of the agricultural and the manufacturing interests, and that hostility in feeling or act between them can only arise from ignorance, or prejudice born of ignorance.

In tracing the relation to one another of our varied productive industries, we cannot too strongly impress the idea that only the higher priced raw materials, such as cotton, wool, and silk, will bear the cost of long transportation, while bulky, heavy, low priced materials can furnish profits only when manufactured in the region where they are found or where they are produced. Cotton raised in Alabama, is manufactured into cloth at a profit in Massachusetts; but iron ore in Pennsylvania is converted into iron, by furnaces, near the mines from which the ore is abstracted. For such reasons the majority of manufactures must depend upon the immediate neighborhood for supply of material. The advantage, moreover, of associating in the same community with those who furnish the crude material, the skilled workmen who supply to the market the fully wrought product, is evident, when we remember that the principal value of most articles depends upon the amount and quality of labor bestowed upon them.

This fact is well illustrated by the value which iron or steel acquires under skillful manipulation. A bar of iron worth $5 is said to be worth $10.50 when wrought into horse-shoes, $55 when made into needles, $3,285 when made into pen-knife blades, $29,480 when made into shirt buttons and $250,000 when made into balance springs for watches. At a recent meeting of the Literary and Philosophical Society of Sheffield, England, Messrs. Cocker Brothers of that city, exhibited a number of very minute watch-springs, with specimens of the steel wire from which the springs are manufactured. The springs are 1-1000th inch in diamater, and one pound of the wire would extend 9 miles. One pound of this wire will produce 5,000 gross of springs, which

amount in the market to £12,500, or between $60,000 and $70,000.

It is true that in the manufacture of textile fabrics, there is not so large an increase of value in the finished product over the raw material; nevertheless, Massachusetts, Rhode Island and Connecticut add to their wealth by the manufacture of cotton, drawn from the Southern States, while those States, by exporting their crude products, as they are beginning to realize, are carrying on a system of husbandry which robs the soil of its fertility, and leads to final impoverishment, since they "cannot refresh the energy of their lands, by returning to them a fair portion of their products after they have served their human uses." If cotton cloth can profitably be manufactured in New England from Southern cotton, with what larger profit it can be manufactured, wherever nature furnishes facilities, in the South! The saying is no less trite than true, that no State or people can afford to export raw material only, and import the products of skilled labor from abroad; sooner or later their account runs out in a bank in which they make no deposits. Not unjustly has it been said, that a merely agricultural people can never become, in the highest sense of the term, a thrifty people; they are wanting in that basis of secured resources, which can only be furnished by a *variety* of productive industries.

The most wretched failure, however, which, in the history of the world, agriculture has presented, has been in the liability to famines and attendant plagues, when it has been unsupported by admixture with manufacturing labor. From numerous examples we quote two from the article before referred to, on the "Relation of Agriculture to other Industries." "In all past time, previous to the development of the useful arts, the history of nations is crowded with the constantly recurring instances of wide-spread destitution, disease and death; but no famine or great scarcity has visited any part of Europe within the present century, except those which have not even a tolerably diversified system of productive industry. Ireland has sixteen millions of arable acres, but ten millions are in pasture. The mass of the people are confined for food to a single root, which under the pressure of necessity, is stimulated into disease; and in that country famines frequently occur, and deficiency of food constantly lingers, while happier lands in her neighborhood, have an almost complete exemption. In the great famine years, 1846–'47–'48, England and Wales had just double

her density of population, and their soil is not more capable than hers; but under the terms of the union with Great Britain, which went into full operation in 1821, the Irish manufactures languished rapidly into exhaustion. Thereupon followed the famine of 1822, that of 1832, and the still more terrible one beginning in 1846, increasing until 1848, and lingering and devastating the population until 1851. The people had been confined to agriculture and pasturage almost exclusively, rents rose to the starvation point, and two or three unfavorable seasons in succession, brought the mass of the industrial community into the situation which Thackeray thus describes: 'In the fairest and richest counties, men are suffering and starving by millions; there are thousands of them at this minute stretched in the sunshine at their cabin doors, with *no work*, scarcely any food, no hope seemingly; strong countrymen are lying in bed for the hunger, because a man lying on his back does not need so much food as a person afoot'; and this state of things continued, though somewhat abated, until nearly three millions out of eight had perished, or were driven from the land of their birth, within fourteen years.

"India also is still visited by famines; but is it surprising if the richest soil of the world fails to yield its harvests when the rule of the foreigner, or whatever else is the cause, has restored the jungles of tropical luxuriance to the very garden grounds of the Deccan, and tiger-hunts are the pastimes in spots which still retain the vestiges of demolished palaces and villas?

"But what caused such desolation as this? The trade of India was thrown open in 1813 to free competition. A little while before, that country abounded in cotton, and the labor of men, women and children was employed to such an extent in the work of converting it into cloth, that they not only supplied the home demand for the fine tissues of Dacca, and the coarse products of Western India, but exported to other parts of the world, no less than two hundred millions of pounds of cloth per annum; but after the commencement of that free competition, the poor people were exposed to the rivalry in their own markets, of a nation possessed of machinery greatly more effective than their own. The invaders of their labor-market went still farther; for the very purpose of utterly extinguishing their skilled industries, they taxed every loom in India, and every machine calculated to aid the laborer, increasing the rate with every increase in the industry of the owner, and generally absorbing all the profit arising from its use. The result

of all this was, that in twenty years the export of cotton had entirely ceased, and having destroyed the foreign market of India, England proceeded to take possession of its doomed market. For this purpose '*children* were worked in the cotton mills of Lancashire, from fifteen to seventeen hours per day during the week, and on Sunday morning from 6 to 12 o'clock, in cleaning the machinery.' So the multitudes that formerly filled all the channels of foreign commerce with their manufactures, were driven back to exclusive agriculture, the production of raw cotton being the chief staple. * * * * * * * *

"India has worked out our problem to a demonstration. In her happier days her industries were diversified in advance of all the world, and her agriculture kept abreast of her manufactures. In the early years of the present century her manufactures commenced a rapid decline, going on to nearly absolute extinction. Mr. Thompson in his 'Lectures on India,' finishes the picture that tells the story with such dashes as these: 'Some of the finest tracts of land have been forsaken and given up to the untamed beasts of the jungle. The *motives to industry have been destroyed.* The soil seems to lie under a curse. Instead of yielding abundance for the wants of its own population and the inhabitants of other regions, it does not keep in existence its own children. It becomes the burying-place of millions, who die upon its bosom crying for bread. In proof of this, turn your eyes backward upon the scenes of the past year, (1838.) Go with me into the northwestern provinces of the Bengal presidency, and I will show you the bleaching skeletons of five hundred thousand human beings, who perished of hunger in the space of a few short years. Yes, died of hunger in what has been justly called the 'granery of the world.'"

In addition to the cases already cited, it is not needful that we do more than allude to that terribly devastating famine, that prevailed for months in Persia, commencing in July, 1871, and that which a few years before prevailed in Northeast Prussia, causing extreme destitution and consequent suffering in a region totally given up to the production of food.

It is a fact no less remarkable than true, that famines, or even scarcity, occur only in regions devoted almost entirely to the production of food.

These facts suggest the remedy or rather the means of prevention of such calamities. It is to be found in maintaining such a

relation between agriculture and mining, mechanical and manufacturing pursuits, as shall favor in the highest degree their interlinked prosperity and thus secure in a state of efficiency that *most important of all markets, a reliable domestic market.*

In our own State it can hardly be urged that the grand purpose for which we are to labor is to avoid famine or prevent scarcity.

So intimate are our relations with all sections of the country, that even if our people were devoted more exclusively than they now are, to agriculture, to manufacturing, or to any other of the industrial pursuits, we should have little to fear even when the season refuses its wonted bounty ; but the spirit of the nineteenth century will not allow us to rest in our present condition. Our young men demand that we offer them, for a home in Maine, something besides mere subsistence as a reward for labor, whether of hand or brain. They demand inducements to remain in the State equal to those which they may find elsewhere. The capabilities of our State are great, our resources abundant, and our young men are needed to aid in their development.

We shall only be true to ourselves and just to those who shall come after us, as we endeavor to establish that harmony in the relations of our productive industries which shall insure permanent material prosperity.

The British Islands with an area less than four times that of our State, support a population of nearly thirty-two millions (31,817,-108), France, with an area less than seven times that of Maine, has a population of thirty-six and a half millions (36,594,845), and Belgium, with an area about one-third that of our State, maintains a population of more than five millions (5,021,336) of people.

With a proper economy of our forests and yet with no stinted use of the material, they furnish,—with our quarries worked to the limit of capacity or demand for granite, iron, lime and slate,—with the development of all our other mineral resources,—with even a moderate utilization of our unparalled water power,—with an agriculture more progressive, based upon a more intelligent interpretation of nature's laws, and hence more remunerative,—with Maine ships, carrying Maine products to all parts of the world, the coming century should witness within the borders of our State, a thrifty, intelligent and happy population of not less than *ten millions* of people. We, of the present generation, shall have performed only our part in the solution of the problem of the future of our State, if we shall secure to it that diversity of pro-

ductive industries, for which nature has adapted it, and which shall enhance the prosperity of all who may dwell within its limits. *Then* and *then only* may we expect no more to be greeted with the often repeated assertion, that Maine is a good State from which to emigrate; but on the other hand, we may welcome the immigrant to inviting fields of industry, and to more certain rewards of honest labor, and hail the day when the sons and daughters of Maine shall no longer deem it necessary to seek employment in other sections of our country, but shall remain with us and rejoice in the privilege of calling the *Pine Tree State their home.*

At the conclusion of Prof. Fernald's lecture, Gov. PERHAM spoke as follows:

Mr. PRESIDENT: If time permitted I would very gladly attemt to emphasize somewhat further some of the sentiments that have been presented in the very able and interesting lecture to which we have just listened. Time, however, admonishes that the remarks I have to make must be brief, and I promise you I will not tax your patience long. It seems to me the subject we have under consideration this evening is one of great importance to the agriculture of Maine; I believe its future success depends more upon the success of the other industries than anything else. It is a fact that it depends more now upon those other industries than it did formerly—your own county, to some extent, is an exception to this. You are able with your virgin soil to raise large crops, and although our Western friends may not agree with the statement, yet I am thoroughly convinced that you are fully able, in the production of wheat, and perhaps some other grains, to compete with the most favored portions of the West. I know that some may disagree with this, but I am firmly of the opinion that such is the case. I believe the same money invested in lands, and the same amount of labor expended on these lands, will bring more dollars and cents to your doors in the raising of wheat than will be brought to those who live in the West. In the most favored portions of that country, I suppose there is no more than an average of thirty or thirty-five bushels, where it will sell for fifty cents per bushel. But even here you need the other industries in order to make your agriculture more successful. It is a great pity that you want railroad communication, that you have not proper machinery to cut up your hard-wood lumber upon these acres in your

county. If you could have railroad transportation and the means of manufacturing all this kind of wood that is being burnt up, it would more than pay for the clearing of your land thrice over. But when we go into the older portions of this State we find the population is decreasing very much. While the rural population of this State has decreased within the last decade as we have learned, by remarks which have been made, we find that the cities and manufacturing villages have been increasing. The decrease has been in the old farming sections. Instead of dividing the old farm into two or three, as we hoped they might, expecting that the boys would be willing to divide up the farm and make thus more profit altogether, the old farms are being abandoned, many of them being sold out for pasture; and the truth is, however unwelcome it may be, that except in the manufacturing cities and villages our population is decreasing. We want those diversified industries we have been hearing about this evening. Every man who works in our shipyards or quarries, every man who helps to manufacture lime, or to bring to the surface our slate; every man who is engaged in any of the manufactures of cotton or woolen must have something to eat, and he must have something we cannot bring from the West. Now, there are certain things in the production of which the West cannot compete with us. I have a friend, who may be here this evening, who lives not far from the cities of Lewiston and Auburn, where they have an excellent market, growing out of the fact that they do a large amount of manufacturing—and he is getting rich rapidly, producing $400 per acre from some of his acres; and this is not an exceptional case. Now, we have water-power in immense quantities running to waste all over the State; enough to carry all the machinery of this country, and which if developed, would bring into requisition these farms which are running to waste. Now, there are other industries which are being developed in this part of the State. Take the manufacture of cheese; a year ago we had only two factories, now we have twenty. I met the other day one of our shrewdest farmers, who had been carrying his milk to one of those factories, and he told me he had made up his mind to double his cows, for he was satisfied it was the best business he could engage in.

We have, in some localities, manufactories where they prepare corn for the market; where they are canning sweet corn. A farmer told me he was raising corn for that purpose, and that they

are getting from fifty to one hundred dollars per acre for the corn they are raising. And so we might go on and enumerate these industries which go to build up our agricultural interests, but I will not trespass further upon your patience.

Hon. E. G. HARLOW spoke as follows:

Mr. PRESIDENT: It is very often remarked that at about the close of the meeting an adroit presiding officer will call out some one to disperse the crowd, and make them pass off agreeably. Standing before so many practical farmers, and having had a very limited practical knowledge of agriculture myself, I do not feel like giving much advice to such an audience as this. I have often read, and I have always *thought*, that thoroughness in business was one of the main-springs to success; and I believe this applies as well to farming as to any other of the professions or pursuits of life. If I can understand what was to be drawn from the very able paper which has been read to us this evening, it is, that we are to look around upon the earth's surface and see what has been presented to us in the creation, and to develope and utilize it as fast as we can.

The presiding officer told me a few moments before the Governor sat down that he was going to call upon me. Casting about for something to say, I concluded I would tell a story about cheese factories; but here the Governor has mostly anticipated me. I can only add, that in our own village we turned our attention to the manufacture of cheese, and there we have manufactured thirty-three tons of cheese this year. We think it is a great success. I will tell you a little more particularly in regard to it. Twenty-four of us put $40 each into the building and machinery for a factory, and we have divided this year 8 per cent. upon that investment. We get two cents a pound for the manufacturing of cheese, and the farmers are very well satisfed with it. We are about to go to manufacturing tooth-picks. Now we have a man located in our neighborhood who is about rigging machinery to start this business at Dixfield, and although not posessed of much capital, he has been manufacturing tooth-picks and cigar lighters at Canton, and we find his pockets full of money. But I will not at this late hour pursue the subject further, and congratulating you upon the success of your meeting, and thanking you for your good attention, I will now take my seat.

SECOND DAY.

The Convention met at 10 o'clock, and was called to order by the President.

A paper was then read on

Our Dairy Interests.

BY J. W. LANG, MEMBER FROM WALDO COUNTY.

Our State seems to be taking a step forward in agricultural progress, which is cheering. In every department of practical husbandry, there is inquiry and research. Our fruit growers not content with single efforts, have banded together and asked the Legislature to incorporate them into a corporate body for associated effort. Our poultry men have done the same. Our farmers are organizing new clubs, county associations and societies; the out-look is cheering, and associated effort is the order of the day. The farmer has learned that, hitherto, he has been too much isolated; that he has walled himself in and others out too long. The old system of road fencing developed itself in the character and prejudices of the farmer. We are returning again, slowly perhaps it may be, to wheat growing. Our supply, to-day, of Western flour, of which Maine consumes 650,000 barrels, comes from beyond the Mississippi. It is getting to far too go to mill, considering the toll exacted.

We are waking up and taking an inventory of stock, and too many find that they haven't much to take an inventory of. Neither have they much in pocket or soil; yet they have labored early and late, hauled rocks and dug potatoes—ah that's it! they have dug too many potatoes. They have tried to raise stock; they have sold hay, and dabbled in most everything in the farming line, yet they don't feel satisfied; they see the point now, or are groping around to find it; they are inquiring, willing to learn, seeking a way out of the old ruts. There is hope for such men; but they are not all taken so yet, though let us hope they will soon be.

Dairying, just now seems to be claiming a large share of attention. It has been carried to a high degree of perfection and profit in other States, and they have out-stripped us, and we acknowledge it and are inquiring how they did it. We first observe their climate and find ours similar,—Ohio, New York, Ver-

mont and Massachusetts,—all very much like Maine. We next look to their natural features, and find still a resemblance, with much in our favor. Next, to their markets, and lo! the world is before us; we find they excel us in no particular that is an advantage. Our soil, our surface with its sunny hills and fertile valleys, our bracing, healthy climate, our pure water so very plentiful, all gives us equal, if not superior claims. No where on this green earth, can dairying be pursued to better advantage than in our State,—cheap lands, excellent grazing, the home of the best forage plants, cheap labor, fencing materials, building materials, and abundant means of transportation. Our farmers are beginning to see this, and less number of bushels of potatoes go to market, and less of hay is sold. Less of the life-blood of the farm is taken. But the change cannot be made at once. There is want of knowledge how to proceed; there is too much lack of resolution; there is a tendency to lay back and "see how it will come out," full as wise as the captain who waited to see if the fair wind was going to hold before sailing.

But haste makes waste, and drowsiness will clothe a man with rags. Take your choice; both same price. I take the medium course. The greater part of the lands of the United States are excluded from dairy farming, on account of situation and natural unfitness. Those lands lying between the 40th and 45th parallel from the Atlantic to the Mississippi, embrace nearly all that is available. Only one-third of this narrow belt is of highest excellence. This belt embraces New England, New York, Ohio, Wisconsin, Michigan, and part of Illinois and Indiana. The Eastern section is the best, and its excellence for milk production decreases as we proceed west. The requisites of a good milk producing country, are high, undulating surface, abundance of good water, and soil retentive of moisture. This induces the abundant growth of sweet, nutritious herbage, frequent showers, a cool climate, and a healthy, pure air. We have no large, uninterrupted stretch of country, where dairying can ever develop itself into a specialty, but rather, it must ever be confined to sections in the States before mentioned. Grain productions in these natural dairy regions can never compete with the prairie country, or the broad, natural cereal fields of the South, or the rich Pacific slope. Stock raising can never, except for local markets, compete for a moment with the wide ranges beyond the Father of Waters; but this belt must ever rely upon three leading specialties,—Dairying, Fruit

culture, and Sheep husbandry. Those parts of it not best adapted to milk, are specially adapted to the raising of apples and small fruits, or to mutton and wool raising.

The rapidly increasing consumption of cheese, with its corresponding increase in price, together with the limited sections that must always be looked to for the chief supply, and our rapidly increasing foreign market, renders an over production utterly impossible. It will have its fluctuations, as everything else is liable to; but to render it a drug, and keep it down to a price that does not pay to produce, is just as impossible as to keep down the prices of flour, sugar, tea, or meat. North and South of this dairy belt of our country, the milk is poorer in quality, for the grasses are less nutritious, and the yield of milk less per cow. Consequently less cheese or butter can be produced, and at more cost. Also the butter and cheese is of poorer quality. New Jersey, Southern Pennsylvania, Virginia, Kentucky, and all States south of these are practically excluded. Canada, except its southern half, is also practically excluded. And this exclusion arises from natural features and climate conditions.

Our dairy operations, henceforth, like most other industrial operations, can best be carried on by association. This cheapens the cost of production, and adds to the value of the article produced, by making it of uniform quality. The day of private dairying is fast passing away, for reasons of necessity, and unprofitableness. When Jessie Williams, the unpretending farmer of Rome, N. Y., in 1850, conceived the idea of associated dairies, it was for the simple and sole purpose of relieving his family from the labor of manufacture, and he had no conception of the great and true principle of industrial wealth he had hit upon, and the mighty burdens it will lift, during all time, from the aching arms of toil. The name of Jessie Williams will ever be connected, and greatefully remembered, wherever associated dairying shall have a foothold.

Decidedly, under present circumstances, cheese factory associations offer the best inducements in which farmers in good grazing sections of Maine, to engage. Those three pioneer factories already established, and the score of others that started last spring, demonstrate that for five months a cow averages $50, whose milk is manufactured into cheese. Instances are on record where cows have returned $100 for five months.

The real value of milk as food is not appreciated. Our best

informed men tell us one pound of cheese contains as much nutritive value as two pounds of beef. A good cow will make from 500 to 600 pounds of cheese per year. Or equal to ten to twelve hundred pounds of beef for the same time. And there is another item in favor of the cheese, it is ready for the table, while the beef has to be cooked and sufferers nutritive loss in other ways. And the cheese has no bones in it (though it may have a few skippers.) The increase in consumption of cheese in the United States is at the rate of 13,000,000 pounds per annum. Our export of cheese rapidly increases, and at the rate of about 25,000,000 pounds per annum. In other words, our markets demand, each year, an increase of about 40,000,000 pounds. The price of butter is higher in this country than in England, and this because home consumption has outstripped the supply. Formerly we exported large amounts to other countries.

In Europe, demand for all dairy products outstrip the supply each year, and this is true here with us, notwithstanding the rapid increase of associated dairies. In proof of this, note the high price of cheese and good butter in our large cities, and even anywhere. Also the steady increase of prices during the last twenty years.

Five hundred gallons of whey make twenty pounds of butter, and factories running four vats can make a tub of whey butter per day, worth $600 or $700 per month. The whey after the butter is extracted is just as valuable for hogs as before, as has been proved by experiment.

The only way for farmers in Maine to keep up with the times, to make farming pay its rightful percentage, and to keep our boys and girls at home, is to adopt some specialty, not wholly to the exclusion of other branches, but which shall be the leading, salient point about which the others shall come in as helpers, and in which they may become proficient, attain high excellence, and command good prices. Show our boys and girls there is money in farming and they will not be so ready to leave it. Relieve it of too much drudgery by associated effort, and you will add to the inducement further.

Milk as a whole is poorly understood even by those of us who have never been weaned. When viewed under the microscope, milk appears as a transparent fluid, in which float innumerable small egg-shaped globules. These globules consist of fatty matters enveloped in their shells of curd or casein. Take out

these globules and we find remaining in the fluid in solution: first, curd or casein; second, albumen; third, milk sugar; fourth, mineral matter. Good milk is composed of the following per cent of elements:

Water	87.40
Butter	3.43
Casein	3.12
Milk Sugar	5.12
Mineral matter	.93
	100.00

It is these substances that render milk heavier than water; two of these elements the dairy man seeks to extract and preserve. These two elements are butter and cheese when properly elaborated. The globules of fatty matter by mechanical action, or by process of heat burst and yield up their oil—butter—which clusters together under certain conditions and can be easily taken out of the residue that is left, which we call buttermilk. Being lighter than the rest of the milk, when left at rest, these fatty or butter globules pass upward and form a scum over the surface, and are known as cream. The sacks which contained the butter, after having been broken by churning, pass off in the buttermilk. Milk becomes sour because the sugar in it by exposure to the air has turned to an acid, and is known to chemists by the name of lactic acid. It is a first step in a chain of decomposition, to which milk is subject by the laws of nature.

When rennet is applied to milk, it causes it to coägulate rapidly and form a curd. In doing this, the rennet, which is an infusion of animal membrane,—the stomach of the calf or pig,—containing a pungent acid known as gastric juice, dissolves the curd sacks in which the butter is contained, and by its affinity and the attraction the particles of curd have for each other, a mass is formed; in this mass is a large per cent. of the butter of the milk; the residue of the milk after being curdled is known as whey and is drained off, and the curd, after proper manipulations put to press to expel what may be left of whey among it. In these processes, a portion of the butter escapes with the whey, and is either lost, or collected and manufactured into what is known as whey butter. This can be made a very profitable item of income, as I have before shown.

Cleanliness and care are the first and last rules in dairying. All implements used *must* be kept perfectly clean and sweet. The milk, if to be delivered to a factory, when drawn at night, should be set in a bath of pure spring water, cold, and be stirred till it is as cold as the water about it; the morning's milk should also be cooled in the same way before putting both together in the can, otherwise, in hot weather, the milk will arrive in bad condition at the factory, often. It requires only a little time to attend to these little details, and they are very essential.

Cows should have rich upland pasture, and great care exercised that they are not worried or hurried in going to, or returning from pasture. Dogs are an abomination to dairying districts, as well as to sheep ranges. Gentleness will tell upon quality as well as quantity of milk; kicking and banging of cows, racing them to and from pasture, dogging them,—induces overheated, diseased milk,—it induces ferment and decomposition. Nervous agitation affects even the health and produces changes in the muscular fibre of men as well as animals. At the battle of Fair Oaks, the soldiers who were killed upon the most dangerous part of the field, and consequently, before death, were subjected to greatest mental excitement, were found to be the most decomposed at the burial of the dead; and numerous other instances are shown which prove this to be a fact.

A cheese factory or butter factory should be located at the side of a hill so as to have one story partially below the drive-way where milk is delivered, and so as to have pure water led in pipes to each story, and in a pipe across one side, with faucets at convenient distances, so that water will always be at hand, which will save much expense in conducting the operations. The factory should be situated so as to have pure air, and not near any sluggish water, bog, or other impurity. It is always best to build large enough—double the size at first needed is a safe rule. Thirty to forty, by one hundred feet is a proper size, if three stories high, for four hundred to five hundred cows. Even six hundred could be accommodated by such a building, and its cost would be but a few hundred dollars more than one of half the capacity, that would cost as much to enlarge, as it did to build in the first place.

Milk can be profitably gathered five or six miles with teams, and the better way is to have three, four or five men do the gathering. They can do it cheaper than for each one to do his own trucking,

and can return each patron's whey where they take the milk. The factory need be only boarded and battened, with a tight roof, and suitable doors and windows, with tight floors, and proper ventilators. No ceiling, lath or plaster is needed. The presses are simply large screws, working through a solid beam, and having a platform beneath, on which the cheese is placed. They are arranged thickly along one side and occupy but little room. The vats are provided with fire box beneath for heating the milk, previous to curding. Iron hoops are coming into use. One of the best vats is that of W. Ralph & Co., Utica, N. Y., a specimen of which may be seen at Orono, at the State Agricultural College. The milk cans should hold ten gallons, and be without faucet. One known as the iron clad can, is said to be a desirable article.

Not only the direct profits arising from the milk by its manufacture into cheese induces the farmer to embark in this system of associated dairying. His fields are worn and hungry. They need manure. They have been drained of elements that have not been replaced. We are obliged to raise something to sell, and hitherto it has been hay and potatoes. We are all satisfied this is wrong, that it does not pay, that it is exceedingly poor farming, and that there is a better way. Dairying will oblige us to keep cows largely; to consume all our hay, roots and vegetables on the farm, and we shall have fat manure heaps. We shall thin off our already too many horses, and replace with cows. Having large quantities of whey, we shall keep hogs to greater extent than now. Hogs are the best manure machines invented or known. We do not raise our own pork now; but shall have a surplus then. Having plenty of manure both at the barn and in the hog-yards, we shall grow our own bread by raising wheat and corn. Here, by raising our own bread, we stop a mighty leak. The straw, fed with the shorts obtained, will equal the feeding value of the hay that would have grown upon the same ground, leaving us the flour as profit for our pains. Having pleanty of milk, butter, cheese, pork, flour, a productive farm, growing richer year after year, instead of as now poorer and poorer, a fine herd of cows, a few good blood sheep, an income of $50 per cow per year, the burden and care of milk lifted from our women by the aid of associated dairies, ourselves freed from dirty distasteful potatoe growing, except for home use. Our chief farm labor being care of our cows, planting and care of special forage crops, haying and harvesting, we shall

live easier, and make more. This is how the associated dairy outlook seems to us. Am I right?

Perhaps you may think me too enthusiastic. But if so let me take you to Western Reserve, Ohio; to Orange, Herkimer, and other dairy counties of New York; to Chester County, Penn.; to Vermont; to Massachusetts; and prove my assertions. We have every facility they have; we have advantages over them for cheese manufacture.

How shall we engage in associated dairying? How shall we get up a cheese factory? By coming together and agreeing to each one do what he can in money, cows, and even credit. Take hold and get up a suitable building for manufacture. Hire your money to do this with on joint note, if you please; or set shares at a certain price, and get enough taken to cover your cost of building. Place your most expert and available man in charge of the factory, after he has studied up, and taken lessons at some factory already in operation. Believe in the enterprise. Don't wait to see if a fair wind is going to hold till it is all over.

We believe that associated dairying is to work vast good to the farming community of Maine,—that our green hills and charming vales are to be thickly dotted with the noblest kine, and that a new era of prosperity is dawning over our rural towns. Go on; the times are auspicious, and brain as well as muscle is demanded in the ranks of farmers of to-day. We supply too much brain to the professions, to the trades, to the mercantile pursuits, and keep too little on the farm.

If we have a smart boy he must be educated, and then he must be a lawyer, doctor, teacher or minister; he must be a jeweller or a clerk, but dull Jack we keep at home and think he is only fitted to farm it. If you have a smart boy, educate him for a farmer,—let the dull Jacks be to make lawyers out of. If we devoted the time and talent to farm improvement we do to an exciting political campaign,—and for whose good?—we should see wonders accomplished.

All hail the day; the natal day!
Of bold improvements made;
Our noble State its dawning ray,
And last expiring shade;
Catch up, and press along, and make
Your own its opportunity,
Your own, your children's sake
Demands this liberty.

At the conclusion of Mr. Lang's paper, Mr. Daniel Spooner of East Dover gave some account of the cheese factory established in that town in the spring of 1873. The building is 32 by 60 feet, and cost $1,700,—this sum being much less than was at first anticipated. Operations were commenced June 25th, and closed August 30th, in consequence of the severe drouth which caused the flow of milk to be very small. In this time, over 12,000 pounds of cheese were made, most of which was sold in the villages of Foxcroft and Dover. The vat was made by our own workmen, and cost about $80. The milk of one hundred cows was used at the factory, and it would have cost but little more to run the factory on the milk of from two to three hundred cows. As an evidence of the success of the factory, Capt. Spooner stated that the factory company made the cheese for one man who furnished the milk of seven cows and two heifers for a period of eight weeks, charging him 2½ cents per pound for manufacturing, and at the end of this time, turning over to him 1020 pounds of cheese, which at 15 cents per pound would amount to $150, or after deducting the cost of making, $130. He regarded this as very satisfactory for the milk of this number of cows for a period of eight weeks.

In response to a call, Hon. J. R. Pulsifer, of the Executive Council, gave some account of the cheese factory at Mechanic Falls. The building was put up this spring, which made the season short, as the factory did not go into operation until the first of July. The expense for the factory and machinery was $2,500. The company paid 12 cents per gallon for milk delivered at the factory, and they had an experienced cheese maker from Vermont to superintend the operations. By the use of sweet corn fodder fed to cows, they would be enabled to extend the season of making cheese to about the middle of October. At present they are making one pound of cheese from eight pounds of milk.

AFTERNOON SESSION.

The Convention met at 2 o'clock, President Percival in the chair.

Following out the train of thought that formed the forenoon's discussion, Mr. Colburn of Kennebec, made some remarks in which he differed somewhat from the speakers who had occupied the forenoon; for while they favored the making of cheese, and

thought we should do our best to encourage cheese factories, he believed some attention should be given to the making of butter. If we all go to making cheese, where is our butter coming from? It is true, the question of butter or cheese making is one in which local circumstances come in to determine the character of the product made. He was somewhat interested in butter making, having a private dairy of about twenty cows. One year (1862) the amount received from eight cows, including the profits of the piggery, which should be reckoned in connection with the dairy, was $1,300. The average price received for butter during that year, was 50 cents per pound. He thought it a poor cow that could not make 250 pounds of butter per year. Our farmers ought not to make poor butter, and ought not to sell good butter at a low price. He believed farmers living on the line of the E. & N. A. Railroad, or on a railroad running through Aroostook county, (should one be built,) could make a superior article of butter, pack it in ice coolers, send it to a Boston market and make money by so doing. Another advantage in keeping cows, is that by housing them nights, and using absorbents, a large amount of valuable manure is obtained. Several other gentlemen made brief remarks upon the subject, after which, a paper was read on

The History of Agricultural Implements.

BY D. M. DUNHAM, OF BANGOR, MEMBER AT LARGE.

The plow may be regarded the chief means for successful tillage, and is of such importance, that is has from time immemorial become the symbol of the agricultural profession. Notwithstanding the many recent contrivances of rotary diggers, grubbers and such like instruments, it is not probable that the plow will be very soon superseded. It is so generally acknowledged, that it has passed into a maxim, that the plow lies at the foundation of all wealth, and is the basis of all civilization. Its use dates back to a very remote antiquity. It is certainly strange, in view of the importance and the antiquity of the plow, that its construction should have received so little attention from scientific men, and the principles upon which it works should have been so little observed by those who habitually use it. The simplest plow, used in the earlier ages of the world, and found at the present day only among degraded nations, is the crooked limb of a tree, with a projecting point for tearing the surface of the earth. It was with a plow like this, that the servants of Job were plowing when

the Sabeans came upon them. It was with such an one that Ulysses plowed among the sands of the shore at Ithaca, when he feigned madness before the messengers of Agamemnon.

The most ancient monuments of Egypt, dating back at least three thousand years before the christian era, reveal to us a slight modification of this implement, quite as rude in form, yet somewhat more powerful in execution. What were its form or efficiency when Elisha was summoned from plowing with twelve yokes of oxen, to assume the mantle of the Hebrew prophet, may not be quite apparent, but no description of a plow upon scientific principles is given until a very recent date. It is impossible to say who first invented the plow; but the Greeks, who always had a piece of history for every emergency, tell us that Ceres was the inventress and guardian of agriculture,—it was under her inspiration that the plow was invented.

The divine origin of agriculture was devoutly believed by the Greeks and Romans, as well as the Egyptians; but like all other false beliefs, it worked great practical injury. It was reckoned impious to change the processes which had been expressly revealed from heaven, lest they should appear to derogate from the wisdom of Ceres and thus incur her displeasure, which of course was an absolute barrier to all improvement. In fact, it would seem that more than the shadow of that delusion had reached down to the present day, since, in no art known to man, is it so difficult to give currency to new processes as it is in agriculture.

A great improvement in the plow, was the invention of the iron mould-board and landside. An approach to this, was made by Joseph Faljambre, of Netherham, England, who in 1720 took out the first patent of the kind recorded. One of these patent plows was imported and used by George Washington, with much satisfaction; but becoming worn, our plow-makers were unable to repair it. Like most other improvements in agricultural machinery, the iron plow came tardily into use, though doing much superior work at less than half the cost. Sir Robert Peel in 1835, having presented a farmers' club with two iron plows, on his return found the wooden plows at work; one of the members said to him, "We have tried your plow, and be all of one mind—that they do make the weeds grow."

A similar prejudice opposed the first iron plow in America, patented in 1797 by Charles Newbold, of New Jersey, who after spending $30,000 in trying to get it into use, abandoned the

attempt, the farmers declaring that iron plows poisoned the soil and prevented the growth of crops. Another says, "Like an evil genius, they destroy the crop and increase the growth of weeds."

Strange and ludicrous as these statements may appear, such is the progress of agriculture, that there will probably be made upon this very floor utterances that would sound quite as ludicrous to our own ears even, but a quarter of a century hence. But a few years ago, I was talking with a well to do farmer in the vicinity of Bangor about a certain implement, and I said, "Sir, if you could with your horse do in one day, what it would take you a week to do by hand, and have it look just as well and yield as much crop, wouldn't you prefer to do it in that way?" Said he, "Mr. Dunham, I have always done that work with my own right hand, and I don't believe in bringing up my boys in any such lazy sort of way." The next year he came to my place and bought the implement, saying at the time, "Sir, you are ruining all the young men in the country, setting them crazy for improved implements."

Mr. Joel Nourse of Worcester, Massachusetts, when 21 years old, had learned the blacksmith's trade, and that year made six cast iron plows. The next year he wanted to make twenty-five, and he went to an uncle of his who was in the habit of letting money, to hire money to buy stock. Said he, "Joel, if it was anything else in the world but to make those cast-iron plows, I should let you have it; but you will lose all the money you put into it, besides losing your time." This blunt refusal and thrust at his pet implement, was equal to a snowball in both pockets to cool his ardor, but such was his faith in the plow, that he determined to persevere at all hazards. But a few days after, his uncle came into the shop and said, "Joel, I have seen a man who used your plow last year, and if one half of what you say, and one-tenth of what he says is correct, you have but to persevere and you are sure of a fortune; I shall let you have the money." He went on from this till 1860, when he and his firm had made more implements, and they were spread over a wider territory than any other firm in the world. In 1861 the reverses of the war swept his business and property from him, and his *life-work* failed to secure for him even a home in which to spend his declining years. A similar fortune has been true of the majority of inventors and manufacturers of agricultural implements the world over. Those who have secured even a competence are rare indeed.

Such has been the prejudice against improved implements, that many times in England, workmen have banded together and destroyed the implements and their places of manufacture, declaring that labor-saving machines were an infringement upon their rights, and their use would not be allowed.

But a few years since, Messrs. Glidden & Williams, who ran a line of vessels to California, in order to facilitate loading, placed an engine upon the wharf to do the hoisting; and such was the feeling against it that all the hands left, and they could not hire a stevedore in Boston who would work if they worked the engine, and they were obliged to send away to get men to load their vessels, and had to put on a strong police force to keep them from destroying the property. One of the workmen came up to the engine shaking his fist at it and said: "Ah Mr. Engine, you can do that; but you can't vote, and we will fix you next election day." Gentlemen, your implements can't vote; but the man who uses improved implements will find more time and more inclination to study up the great questions of the day, and find himself more useful in all that goes to make a prosperous community.

The high price of labor in America, of late, has greatly stimulated mechanical invention. When the utility of labor-saving appliances in agriculture shall come to be fully apprehended and made generally available in the clearing, draining, and tilling of the soil, in the planting, irrigating, and harvesting of crops, we may regard the occurrence of famine as practically impossible.

Attention appears to have been first strongly awakened to the value of mechanical aids in farming, about the period of the first introduction of agricultural societies. The Royal Society, established in England in 1660, encouraged improvements in agriculture.

The first associated effort made in England, to encourage agriculture by specific rewards, was in the premiums annually offered by the Society of Arts, after the year 1758, for experiments in husbandry and for improved farm implements. The first agricultural society in Great Britain, the Society of Improvers in Scotland, in 1723, encouraged improvements in tillage, and in farm implements, with such effect that more grain was grown yearly where grain was never grown before than a sixth of all the kingdom used to produce at any previous time. About the same time, Jethro Tull introduced the use of the horse hoe, the drill, and other improved implements, and became the greatest practical improver of

agriculture in the last century. He even attempted a threshing machine, and incurred the usual charge of being a visionary innovator.

The profit of drill husbandry was also demonstrated by John Wynn Baker, of Kildare, Ireland, who in 1766 commenced a series of experiments, with a view of systematizing agricultural knowledge, by establishing fixed principles of rural economy, and showed by actual experiment that the saving effected by the drill and horse hoe, amounted in 15 years, to the fee simple of all the farming lands in the kingdom. Notwithstanding these experiments a hundred years ago, these implements are in too little use to-day. Some even declare to-day that the horse hoe promotes the growth of weeds, when it is well known by all inquiring minds that with proper tools, clean culture may be made with one-fourth of the expense of ordinary hoeing.

You have all read that a sower went forth to sow, and as he sowed, some fell by the wayside and the fowls of the air came and devoured it; some fell among thorns, and they sprang up and choked it; some fell upon stony places and sprang up, but not having much depth of earth, quickly withered away; while others fell upon good ground, and came forth and bore fruit abundantly. Had improved culture and drill husbandry been the practice nineteen hundred years ago, this beautiful parable had been lost; but I doubt not, that such had been the effect upon the people, that our Master had given us a much more beautiful one in its place.

The kind of plow to use depends almost wholly upon the kind of soil, and quality of work to be performed. The sticky soils of California and the West require a steel plow with a long, even mould board, while the rough rocky hills of New England require a shorter, stronger plow. The question of flat and lap furrows has been pretty generally discussed, yet the advantage one form has over the other is very poorly understood. The Scotch people use the lap furrow almost universally, while the English and Americans as generally use the flat furrow; while very few of either can give any reason for their choice, other than their fathers used it and it is the best way. Deep and shoal plowing, both have their advocates, yet well tested experiments are so rare that few can tell you upon what soils, or under what circumstances the one is superior to the other. A considerable diversity of opinion prevails as to the value of subsoiling; as it usually happens in such cases of diversity, all are more or less in the right,

and all are more or less in the wrong. Yet that a judicious use of the subsoil plow upon the farms of Maine, would add largely to their fertility, I have no doubt.

The harrow, next to the plow, is the most important implement upon the farm; and yet fewer improved harrows are found upon the farms of Maine, than almost any other implement. The plug tooth harrow with the teeth slanting back a little in the wood, such as were adapted to the burnt lands, are more generally in use to-day, than all other kinds combined. A cheap harrow that will pulverize the soil without packing it, is one of the great wants of the farm to-day, and if farmers would insist upon having it, manufacturers would soon meet them with the implement desired.

Most people take it for granted, that reapers and mowers are of quite recent invention; but such a conclusion is far from correct. Others have supposed that some American yankee first conceived the idea of constructing a machine for cutting grain with horses; but history informs us that reapers were in successful operation before Christoher Columbus discovered the Western Continent, and that the sickle and the scythe in some of the Oriental countries, had been superseded by machines worked by oxen. The first account of a machine to reap grain, appears to be that of Pliny, about the year 60 in the christian era, more than eighteen hundred years ago. This historian says there are various methods of reaping grain in the extensive fields of the lowlands of Gaul; vans of large size with projecting teeth on the forward edge, are driven on two wheels through the standing grain, by an ox yoked in a reverse position; these machines are supposed to have been in use several centuries.

The earliest proposal in Great Britain for an implement for harvesting grain, was made by the Society of Arts in 1780, when it offered its gold medal for a machine to answer the purpose of mowing or reaping grain,—simplicity and cheapness in construction to be considered as the principal part of its merit. The premium was continued for several years without the desired effect.

William Pitt soon after invented a reaping machine, suggested by the description of Pliny. A second attempt was made in Lincolnshire in 1793, by another person whose name does not appear. In November of that year, two men named Cartwright, each invented a machine for reaping and mowing. In 1799, the first English patent was taken out by Jacob Boyce, for a reaping

machine acting on the principle of the common scythe. In the following year, Robert Means of Somersetshire, was granted a patent for a reaping machine, propelled on wheels, but worked by hand.

In June, 1805, Thomas J. Plucknett of Kent, received a patent for a reaper having the cutting apparatus suspended beneath and in front of the axle, and the power behind. He took out a second patent in 1807. Mr. Gladstone of Castle Douglass, in 1806 invented a machine with horizontal gathering wheel, and the next year, Mr. Salmon in Bedfordshire, brought forward a plan for raking the grain off a platform by means of a vertically-working rake driven by a large crank in the rear of the machine. Messrs. Kean of Edinburgh, in 1811, introduced the conical drum, and in 1815, Mr. Scott employed a cylindrical rake and projecting teeth. In 1822, Mr. Ogle of Alnwich, invented the large reel or rake for lashing the uncut grain towards the knife as is now done in some English and American reapers. This machine was put in successful operation by T. & J. Brown of that place, after much experimenting; but so strong was the prejudice of the working people against labor-saving machinery, that they threatened to kill the manufacturers if they persevered, and the enterprise for a time was given up.

Some others were brought forward previous to 1826, in which year, the Rev. Patrick Bell of Scotland, produced the oldest machine now known to be in use, having a revolving apron, or endless web for gathering, accompanied by Ogle's rule in front, which attracted little attention however, until after the London Exhibition in 1851, when he adopted McCormick's cutting apparatus, since which, it has been used to considerable extent. From the closing of the fair in 1851, to the end of 1852, no less than twenty-eight patents were registered in England for inventions relating to reaping or mowing machines. Patents had been previously granted to this class of machines, in Russia in 1831, in Austria in 1839, and in Australia in 1845,—the last mentioned, introduced at Adelaide, South Australia, by Mr. Ridley, reaped, threshed and winnowed, all at the same time, at the rate of an acre an hour. Whether from intricacy of construction, or other inherent defects, or, as seems more probable, from indifference on the part of the public, none of these instruments came into permanent use, although they provoked the untiring opposition of agricultural laborers.

The first American patent for cutting grain, was issued in May, 1803, to Richard French and J. T. Hawkins of New Jersey. Samuel Adams, of the same State, followed in 1805. J. Bailey of Chester county, Pennsylvania, patented in 1822, a rotary mowing machine, having six scythes attached to a shaft. Up to 1828, eight other machines were registered,—when Samuel Lane of Hallowell, Maine, patented a machine for cutting, gathering and threshing grain, all at one operation; it does not appear, however, to have been successful. American reaping and mowing machines are now introduced into every civilized country. American agriculture could not have attained its present condition, had the introduction of reaping and mowing machines been delayed thirty years. The extent to which they are already used is enormous.

Since 1852, when mowing machines first began to be introduced into New England, the improvement has truly been wonderful. The Allen, Manny and Ketchum machines were the first to knock at New England's door, and although they had proved a success in the West, where the grass and grain was coarse and stiff, they proved nearly a failure in New England; and had it not been for the untiring perseverance of our manufacturers, they would have gone to an untimely grave, and this generation, at least, would have gathered its crops in the old way. Nourse, Mason & Co., of Boston, were the first to manufacture the Ketchum machine in New England; the machine then weighed about 1200 pounds, the sections were very broad and the motion slow; but in less than two years they had reduced the weight to 500 pounds, narrowed the sections one-fourth and quickened the speed, so that it made a very passable machine. They made 1000 a year of them for several years, and found quite a ready market; but I do not think, to reckon the time spent in improving and in introducing it, they received one-half as much for their services as you would have to pay to have your potatoes dug, or your wood sawed to-day.

In 1855, the Massachusetts Agricultural Society offered $1,000 premium for the best mower, and appointed a committee to go with them into all parts of the State, and test them upon all kinds of land. The premium was awarded to a machine made in Ohio, called Heath's Eagle. Nourse, Mason & Co., thought they must have the best machine, so they bought one-half the patent right of this machine, for which they paid $10,000; they made 500

machines at an expense of about $40,000, and when they came to put them into the hands of the people, they were so complicated and required so constant attention from a skilled mechanic, that their sale was wholly impracticable, and the only ones ever disposed of was 50 sold at a very reduced price for the Australian market, and the manufacturers had to pocket upon this operation, the snug little loss of $50,000.

I speak of this to show you, that although fairs have had a great influence in bringing new machines before the public, it is not always safe to depend too much upon their decisions.

You will probably ask what is the best mower, to-day? To this I will say that of the improved machines made to-day, most of them will do good work,—they all have their merits and demerits; none quite perfect, yet most of them working remarkably well. If you are going to buy a mower, take a few days time and examine the different ones, and you will be surprised to see how nearly perfect most of them work. The hay tedder is fast coming into use and fast taking an important place among the haying implements to-day. For ornamental farming, a well kept lawn can only be had by the use of a lawn mower, and it is truly wonderful to see how perfectly they work, and the number going into use every year.

With the implements now to be obtained, farming has become the easiest, pleasantest and most lucrative business in which one can engage; but if any of you think differently and would make haste to be rich, buy a patent right of some one vending them through the country, and you will stand about the same chance of making a fortune that you will of catching a streak of lightning that will open a gold mine at your door.

With this I leave you. Prove carefully all the implements used in your occupation; prove them carefully if you have to take time from your sleep to do it,—buy only those adapted to your particular work, and you will have less cause to complain of manufacturers and their agents.

Following the paper of Mr. Dunham, the afternoon was taken up with a lecture on Special Farming, by LEANDER WETHERELL, Esq., editor of the *Boston Cultivator*, the copy of which has not been received for this report.

THURSDAY EVENING.

The Board met at 7½ o'clock, President in the chair. The first exercise was the reading of a paper on

Ornamental Farming.

BY L. H. WINSLOW, MEMBER FROM LINCOLN COUNTY.

Great progress has been made within the last twenty-five years by the farmers of the country, not only in making their farms more productive, but in making them more attractive. There has been, also, advance in taste. There are not so many now as formerly, who decry all attention to the ornamental, as a waste of time and money. This race of niggardly and boorish men is fast dying out. Increasing intelligence, the circulation of agricultural reading, the formation of a larger element of educated and cultivated men in the profession, have had a powerful influence in securing more attention to the beauties of farming, instead of having everything expended for mere pecuniary returns; and this is a great advance,—it ennobles the pursuit of the farmer. Man is a creature of taste, and not a mere grub; and he who neglects to cultivate and gratify this element of his nature, degrades himself. Any one may form a pretty correct estimate of the intellectual, if not the moral condition of his neighbors, by simply looking over their farms. The one who allows his buildings and lands to remain in a slovenly state when he has the means of improving them, may be a money loving, but he will also be a slovenly man, with no elevated instincts. It is not the commodious, expensive buildings which give the proper estimate, because all farmers cannot afford and do not require these; but it is the manner in which everything is cared for. It is a great mistake to suppose that money spent in reasonably improving the appearance of a place is thrown away; tasteful and well painted buildings, well arranged yards and gardens, with *good fences,* plenty of shade trees along the road-side, will set off a farm to great advantage, and make a great difference when it is sold; and even if it be not sold, these things will add greatly to the enjoyment of the owner and his family, as well as to the neighborhood in which he lives. I had in my mind at the commencement of this, to speak of ornamental trees, and of their use; and to my mind, there is no other single way in which a farmer may add more to the beauty and value of his farm in the way of improving its appearance, than by the judicious use of

trees tastefully set out and arranged. There is something nobly simple and pure in such a taste. It argues, I think, a sweet and generous nature to have this strong relish for the beauties of nature, and this friendship for the hardy and glorious sons of the forest. There is a grandeur of thought connected with this part of rural economy,—it is the heroic line of husbandry,—it is worthy of liberal, free-born and aspiring men. He who plants an oak, looks forward to future ages, and plants for posterity,—nothing can be more unselfish than this. He cannot expect to sit in its shade, nor enjoy its shelter; but he exults in the idea that the acorn which he has buried in the earth, shall grow up into a lofty tree, and shall keep on flourishing, and increasing, and benefiting mankind long after he shall have ceased to tread his paternal fields; indeed, it is the nature of such occupation, to lift the thoughts above mere worldliness,—as the leaves of the forest are said to absorb all noxious qualities of the air, and breathe forth a purer atmosphere, so it seems to me as if they drew from us, all sordid passions and breathed forth peace and happiness. It is becoming then, for farmers to cherish these sacred groves that surround the ancestral dwellings, and to perpetuate them to their descendants; with their mighty pillars rising straight and direct toward heaven, bearing up its leafy honors from the impurities of earth, and supporting them aloft in pure air and glorious sunshine. It is an emblem of what a true man should be. He who is this, is an ornament and a blessiug to his native land. He who is othe wise, abuses his eminent advantages, abuses the grandeur and prosperity which he has drawn from the bosom of his country and his farm.

It has been supposed that when a farmer has improved his land so as to make it yield large crops, he has been successful, even if convenience and beauty, if the home and its surroundings, have been neglected and sacrificed. While there has been some money made for the time being, the buildings have been neglected so that home has no attraction for the children, and a farm life becomes unpopular and distastful to them.

It is often thought that nature is usually sparse of leaf beauty. Where the foliage is highly ornamental and the plant scanty of flowers, where leaves assume large proportions and elegant outlines; and to a smaller extent, that she is liable to exhaust herself in an equal way upon this supposition. When we consider the flowering charm of the greater portion of our fruit trees, we are

struck with astonishment that there are no more planted for the sake of their beauty alone. Take the apple in its countless varieties, and just consider that if it did not give such crops of fruit, beautiful to look upon, and more delicious in flavor than half the boasted fruits of the tropics, we should seek after it for the sake of its blushing cups which turns the formal orchard into a fairy land. Then we have the pear, which comes in earlier and furnishes snowy masses of bloom, and with a more picturesque and handsome habit than the apple; but happily with the same fault of bearing a delicious fruit as well as being an ornamental tree. From nearly every hardy fruit we may reap a long harvest of beauty, all being more or less ornamental. We have naught to do but place these objects, usually hidden in the orchard, in any open spots in our pleasure grounds, by wood walks and by the fences, instead of the worthless stuff that now too often occupies them, and, in truth, in many positions where those neither good for timber nor flowers now take up the ground.

Speaking of improvements reminds me that a farmer does not always think of what is needed, and may be done when leisure time occurs. And it recalls to my mind the example of the old farmer, whose affairs were always in complete order and in a prosperous condition. Much of the improvement he made was in odd spells, when the regular farm work was broken by rainy weather, or after finishing the work on a crop and waiting for another to get to the proper stage; and the way he kept in mind just what was needed to be done, was by keeping a slate, on which he noted them. Every man, too, owes it to the community in which he is living, to contribute to the general reputation and to public enjoyment, by making all his surroundings as attractive as possible. There is such a thing as paying too much attention to the outside and to show; but there is a reason in all things, and a measure of time, attention, and expense, should be devoted by every one to making his home more and more attractive every year that he lives. To the jaded, unfortunate, unsuccessful business man, there is no prospect that looks so enticing as that of a beautiful, well improved farm, fully stocked and carefully tilled. It is a haven of rest, where the corroding care, and life-sapping anxiety of a city business is unknown; a domain over which he is king, and where he may enforce his will undisputed by any one. The true pleasure of the farmer's vocation consists in his intimate relation to nature, and his possession of all the rational enjoyments of life.

Could the old passion for more land be transferred into a passion for beautifying and adorning our homes, a greater benefit would be rendered the country and the cause of agriculture.

After the reading of Mr. Winslow's paper, a lecture was delivered on

Science in Agriculture.

BY REV. C. F. ALLEN, D. D., PRESIDENT OF MAINE STATE COLLEGE.

It is too late to speak of the value, dignity and importance of scientific knowledge. Classical studies are not now considered the only pathway to a liberal education. Acknowledging all the benefits resulting from the study of old forms of speech crystalized in oratory and sparkling with poetic fancies; and admitting there are rich treasures of genius garnered up in the sublime contemplations of Greek and Latin poets, orators and historians, which the student of these languages can best appreciate, we cannot suppose that these are the only discipline of the mind. To insist that the study of words is better than the study of things, is to oppose the growing sentiment of the age. Business men have lost much of their reverence for mere literary culture and are seeking for their sons a business education. Colleges so far yield to the pressure, that they establish scientific departments, and larger and still larger means are furnished to advance the studies in science.

Meanwhile, with no little interest, practical men are looking for the results of this departure from old time usages. The over-confident boastings of the advocates of scientific education, and the extravagant expectations of their credulous allies are not verified,—for there is no royal road to learning,—nothing but patient, protracted discipline will make intelligent scholars and profound thinkers. I know there is a superstitious reverence for everything that claims to be scientific, and in the opinion of not a few shallow smatterers, divine revelation, the sacred instincts of humanity, and common sense must alike give way to the wild vagaries of so-called scientists. Study, thought and general intelligence, are the intellectual preparations necessary for every noble life, in whatever special department of investigation or labor the individual may engage. Absolute restriction of thought and exercise of mind and body to one channel of effort, may greatly contribute to mere routine work; yet as more and more man acquires dexterity by restriction to one pursuit, the less will

be his adaptedness to other conditions,—the more perfect as a machine, the more degraded as a man. But the varied pursuits of every agriculturalist will not admit, even in his farm laborers, mere mechanical precision, he needs educated labor to carry out his well considered plans. What are the relations of the scholar to the laborer?—and how does science promote agriculture? These are no unmeaning questions.

The science of agriculture embraces many sciences. Geology, meteorology, mechanics, physics, chemistry, botany, zoölogy and physiology, are not only related to it, as all sciences are related to each other,—they compose it. Agriculture deals with soils, and soils are composed of rocks, of which geology and mineralogy treat. Its various processes are under the principles of mechanics, physics and chemistry; its vegetables are included in the realm of botany; its animals are subject to conditions which zoölogy and physiology describe.

There is perfect agreement between the science and the art of farming. A successful practical farmer has a theory or science, on which his practice is founded; the more he knows of the science,—other qualifications the same, the more he can accomplish. If he fails in practice, it is because his theory is defective; and if he has such confidence in the correctness of a true theory, that he neglects to provide the necessary conditions for success, he is acting on the false theory that these conditions are not essential, or he may from some facts assume that certain principles are true, and find that the most important fact,—the result,—is not in accordance with his assumption.

Though art and science are thus inseparable, they are not always equally developed; there are facts in the practice of agriculture which science, as yet cannot explain; and sometimes there are correct principles known to the scientific, that the farmer obstinately disregards. During the past century, wonderful advancement has been made in implements of husbandry and in the breeding of domestic animals, because in these departments, correct theory has had full sway. But the advancement in chemistry and physiology of the modern times, is but beginning to be felt in farming. The denser populations of the old world are proofs of the practical benefits the farmers have derived from those sciences, which have doubled the products of their acres. Our farmers from superior natural advantages, have not made this application of science to their labor. To make a profitable use of

the forces of nature, we must know her laws, and enter into her secrets; we must also be able to supply the conditions necessary to secure the desired result.

The properties of matter are the same now as at Creation's birth. Force may assume protean forms, but its laws are uniform from age to age. We are therefore able to learn the laws of matter and force, and thus to trace all the phenomena to general principles. We can also learn what conditions are essential for the accomplishment of a certain end. By a skillful adjustment of these conditions, natural forces work out for us beneficent results; and man vainly boasts of subduing nature, but in truth, he is only successful when absolutely submissive to her laws, and obediently following her teachings; "for we can do nothing against the truth, but for the truth."

The science of agriculture, like all other sciences, is but the embodiment of certain facts, which are known, relating to this especial department of knowledge. These facts are the recorded observations of the past, constantly accumulating by the experiments now made. They have been arranged and classified, and the ascertained results have been compared, and legitimate inferences drawn, so that a system of the truths is presented. This may be clearly perceived, so far as general principles are brought to light. As more and more facts are ascertained, and the results of experiments compared with the system of truths already known, clearer and clearer other principles are discovered. Every experiment is a trial of principles, or a question addressed to nature; if properly put, the answer is yes or no to a specific inquiry. But without the knowledge of that which has already been ascertained, the person trying an experiment will not be likely to obtain any new light; for he is only asking questions which have already been answered. By science we not only learn the facts already ascertained, we are also able to put questions intelligently, so as to receive information, increase the boundaries of knowledge, and to bring to light hidden principles, and are thus prepared to obey the laws that lead to success. Well-meaning empirics, ignorant and unskilled, blazon forth contradictory results of so-called experiments, in which nature answers fools according to the folly of their questions. While, therefore, science is indebted to experiments for its facts, experiments guided by the principles of science will alone be successful. There are apparently facts innumerable bearing on the subject of agriculture, nor is there any lack of

treatises on every part of the art. The various methods have been repeatedly discussed. Cyclopedias and dictionaries of agriculture, embracing the whole round of information concerning soils, culture and crops, animals, buildings, and implements, are to be found in our libraries, agricultural journals record the success of new tried methods, seeds, tools, or manures, all set forth with the utmost assurance; yet the statement of facts so confidently asserted, is contradicted by equally good authority, and the diligent inquirer is led to conclude that the theories are mostly the result of erroneous data, vague impressions, imperfect analysis, hasty generalization, and fanciful analogies. There is a demand for more definite information, facts that will throw light on principles half revealed. Curious facts observed may not appear to have any connection with practical results; but no truth is isolated or unimportant. Every fact connected with any department of knowledge, however insignificant it may appear, may be the germ of an important invention. Galvani watching the manifestations of that mysterious current acting on the nerves of a frog's leg, little thought that this force would send messages across continents, and through the depths of the sobbing ocean.

Applied science leads to the invention of right methods in the arts. The knowledge of principles saves the inventor from all vain attempts to accomplish that which is in opposition to natural law. The most important improvements have not always come from those actually engaged in a specific department, or who have any practical knowledge of the art. It is a curious fact that Mr. Clerk of Elden, near Edinburgh, who wrote a treatise on naval tactics, and first recommended breaking the enemy's line, and doubling on his division to the windward, never served as a seaman, and was never on board a man-of-war; yet Rodney, St. Vincent, and Nelson, England's ablest admirals, tried the manœuvre, and one of them wrote letters of acknowledgement to Mr. Clerk, stating that to his suggestion they were indebted for their success. Some who have not been successful in the practice of an art, have been leaders of thought, and guided others into successful practice. One who has done more than any other, by his writings and lectures, to advance the science of agriculture in this State, was unable to make a living on a farm, naturally fertile and productive. Those who measure the worth of scientific thought by the amount of wealth which is gathered up by the student, have a very shallow conception of the good that has been accomplished. Investiga-

tions that have led to success in developing the resources of the State, and have enriched mankind, have seldom rewarded with money their author. The successful inventor impoverishes himself while blessing the world.

There are peculiar difficulties in the way of agricultural experiments; and, as they are ordinarily conducted, the results are not of great practical value. The first difficulty is the varying conditions under which the trials are made by different experimenters. The chemist in his laboratory can control the conditions under which his experiments are performed. He reduces the material to the required mechanical form, he tests the purity of his agents, he applies the forces in measured extent, and if there is any variability in results, he can search out the reason and know the causes of the failure. He no more imagines there can be any difference in the results of the same experiments, properly tried, by him or any one else, whenever or wherever performed, than he thinks there will be, for different persons or localities, variations in the relations that the same numbers, quantities or figures bear to each other. But the agriculturalist cannot control the conditions of his experiment. The varying temperature of the seasons, the wide range of atmospheric changes, are beyond his power. He cannot "bind the sweet influences of Pleiades, nor loose the bands of Orion." The winds and mists, clouds and storms, frost and snow, that sweep over his fields, are not subject to his sway. Nor are they alike in successive seasons. The soil he cultivates is unlike his neighbor's soil in many respects, and no one field has a uniform consistence in all its portions, and the minute shades of difference in regard to the fineness or coarseness of some of the constituents, may be the very difference that marks one portion as fertile, and another as barren. The words of general description do not show either the subsoil and its constituents, the mechanical conditions of the tilth, nor the previous culture.

The agriculturist has to deal with vegetable life, that mysterious force, whose modes of operation are so little understood, superseding mechanical and chemical laws with an energy of its own. Spongy and flaccid roots lift huge masses of stone. The ivy disintegrates the old wall, whose ruins it adorns. The plant vegetating in water, by a subtle alchemy, etches the glass that contains it, and extracts from the vitreous vessel the ingredients necessary for its growth, which the atmosphere cannot supply. Science has not yet unfolded the laws of vegetable instinct. Why

the shrinking mimosa exhibits such sensitiveness, or the silene lays its snares for insects,—why the hop always twines in one direction, and the bean in another,—why the cereus blooms at night, or the sunflower turns its disk to the god of day? The vital force in some plants is so strong that they accommodate themselves to changed conditions, and produce new varieties which continue to thrive in undiminished luxuriance; others, after a few generations, decline and perish. New varieties of agricultural products, for a time, seem to flourish and produce most bountifully; but after a while they are succeeded by others that, with fresh vitality, outstrip their predecessors. Plants whose varieties are so marked under the skillful care of the experienced gardener, revert to their former condition, when no longer under the pressure of high cultivation. Selecting the most immature seeds capable of vegetation, supplying the richest nutriment and most approved cultivation, the florist produces his magnificent show of double flowers. In less skillful hands this variety soon dwindles down to single blossoms of little size. In the culture of cereals, and other farm products, improved varieties can only be obtained by selecting the ripest seeds and applying the best conditions for the developement of fruits, not blossoms. Glimpses of these facts and principles in the peculiarities of vegetable life, only show the exceeding complexity of the problems that science is called upon to solve.

But the agriculturalist has also to deal with animal life, endowed with additional capacities and powers, and shrouded with still more abstruse mysteries. The peculiarities of instinct, temperament, intelligence and disposition, are all to be taken into account by the experimenter, as well as the more obvious and appreciable conditions. These peculiarities may be the result of transmitted tendencies, of accidental variations, or of careful culture; but, to whatever causes they may be attributed, they are so many conditions to be taken into the account, whenever the labor or the products of animals are the subject of experiment. Now if all these complications are not enough to make farm experiments in general so unsatisfactory, you may take into account the means of measurement of agents and products, as generally employed. I am not complaining that we have not adopted the metric system of weights and measures, nor that the bushel of Maine may be somewhat different from the bushel of Georgia; but a cart-load is quite different with different farmers. Estimated weights and

measures cannot be quite as certain as the scale or bushel, and yet these rude estimates are presented as the results, on which science is to be constructed; and when rules of procedure are demanded, the complaint is made that scientific rules and practical results are so widely different, unmindful that the conditions must be exactly like the proposition, to produce results in accordance with the standard laid down.

While these experiments cannot be expected to be correct, yet they are not without value; the multitude of examples serves to balance the individual errors, and the average of many faulty efforts will be an almost certain rule. There is a science founded on the average of contingent results; and the laws of disorder are nearly as well understood and made the subject of calculation, as the orderly movements of natural forces. The expectation of life, however fallacious in individual cases, is true in the great average,—and in any country we can calculate what per cent. of the population will die annually, and of what diseases, and the quota of each,—even murder and suicide are brought under the same law of definite proportions.

Wider observation and comparison are therefore necessary, in order to settle general principles; and the observer need not be startled because observed facts are not in accordance with received theories. Let him carefully note all the conditions and circumstances, and he will not be at a loss to know why the results are different from his rule as laid down by good authorities, and by knowing the reason of the rule, he is able to make such a modification that will cover all the conditions that he cannot control. While, therefore, we can see that even the rules which science has given can be applicable only to those instances where all the conditions are like the models on which the theory is formed, we see the advantage of the study of these principles.

The progress of science is made by the use of the same methods that practical men use; but its success is more brilliant and rapid because it has better means and appliances, and these are more skillfully handled. It knows what has already been ascertained, and how to press the investigation into that which is mysterious. It has trained the imagination and the judgment wisely to compare and cautiously to infer. The labor of life turned into some particular channel of invention or discovery, will be more likely to lead to correct conclusions in that department, than the desultory efforts in the leisure of other absorbing pursuits.

Science has constructed tables by which the mariner conducts his bark across the ocean. These tables are as useful to the navigator who knows nothing of the principles of Geometry and Trigonometry on which they are constructed, as to the educated and scholarly captain. But science cannot construct rules which implicitly followed will lead an ignorant farmer to certain success; the rule must be varied to meet the varying conditions, and the farmer must be educated to make the proper corrections. It is for the interest of the farmer to avail himself of the labors of the man of science, and to learn the principles that have been established. He can only receive definite directions, when the scientific man has been informed of all the conditions, so as fully to comprehend the problem that is to be solved.

Experiments are successful with the farmer, when they increase his products at less expense. Experiments are successful with the scientific man, when they increase his knowledge at whatever cost,—though the practical man might pronounce them a failure. Thus it is, the scientific man is only an indirect producer of wealth. But while the practical man is enriching himself, the scientific man enriches the community.

Science has done much in the past. She has launched huge leviathans, that press their seething course through the billows, in spite of wind and tide, and whitened every sea with the snowy sails of commerce; she rolls her vans loaded with merchandise, with lightning rapidity across continents; she has rifled the mountains of their treasures of iron and coal, and struck the rocks with her potent wand, and they pour out rivers of oil; she has sought the veins of silver, and found the hidden deposites of gold; she has taught man to spin and weave with tireless activity and to sew with fingers of steel; she has shaped the husbandman's implements, taught the shepherd to rejoice in the finer fleeces of his flock, and instructed the herdsman to exult in superior breeds of cattle; she gives Flora roses of brighter bloom, and loads Pomona with more delicious fruits; Ceres invokes her aid to bless mankind, and she fills the horn of plenty. These are her material triumphs. She feeds, and clothes, and transports the body. She does more; her revelations excite the powers of observation, and quicken the perceptions; her laws exercise the judgment; her theories train the imagination; her truths expand the soul. She touches the hand of labor, and it deals the heavier blow, and more deftly directs its force,—but stops not here; her

electric touch thrills the nerves, arouses the intellect, and warms the heart. Conscious of his own worth, the educated man is raised to a higher, nobler sphere. His pleasures are more refined, his joys more lasting and his triumphs are more rational. To convince the indolent, selfish scholar, revelling in the fair humanities of olden time, that toil is not a curse, science crowns the toiler with glorious success, and gives to the workman the imperial sceptre of strength, and places on his brow the diadem of a benefactor.

With more perfect accord between science and labor, there will be less complaint that farming does not pay; and more and more will the true dignity as well as the utility of this noble employment be manifested.

The scholar is to take the problems that the laborer presents, and with his better facilities, with all the light of previons experiments, and all the advantages of purer agents and laboratory practice, solve the questions. He is to communicate the results, to disabuse the community of erroneous conceptions of what science can do, as well as to impress the principles that tend to promote the welfare of those that toil in the cultivation of the earth; to seek to add something, from his own observation, to the general fund of knowledge; and ever faithful to the light of science, to refuse his sanction to wild vagaries unsupported by facts and irreconcilable with principles already known.

What has science to do with the advance of agriculture in the future? As we have already seen, it has done much in the past in the improvement of implements, in stock, and it is unfolding now the laws of chemistry and physiology, and showing how soils can be ameliorated, how plant food can best be supplied, and how animals may be perfected.

There comes to us from the old world, the results of great scientific organizations, laboring in the field of agricultural chemistry. In England, and especially in Germany, scientific men are massing up facts and experiments carefully performed, and are constructing tables of values and proportions of products; so that there is laid a solid basis of knowledge in a department where, hitherto, mere empiricism had only thrown its discordant cross lights.

American science must shape these results, so as to harmonize with the peculiar conditions of our own land.

Our agricultural department at Washington must be something more than a head. It should be a living soul, a heart beating in unison with the great want of the people, receiving the mass of facts and experiments from all the extremities of our land, and sending back its rich life current of principles. Every agricultural college should be an experimental station, our boards of agriculture an association of scientific farmers, whose practical work and thoughtful essays may elucidate some of the mysteries of the great theme, our county societies should dissiminate rules of correct practice, illustrated with examples of success in the various specialties of farming, and our fairs should exhibit other attractions than an exhibition of the speed of horses.

THIRD DAY.

The Board met at ten o'clock, IRA C. DOE, ESQ., member from York county, in the chair. After the performance of some matters of business, a paper was read on

THE BREEDING AND FEEDING OF FARM STOCK.

BY WARREN PERCIVAL, MEMBER FROM THE STATE AGRICULTURAL SOCIETY.

I have selected for my subject, the breeding and feeding of farm stock; and am aware that in doing so, I shall subject myself to much criticism, in consequence of the diversity of opinion amongst gentlemen of experience and intelligence in regard to this subject. I do not propose to discuss the merits or demerits of the different breeds or races of domestic animals, as I should involve myself in a world of perplexity and argument. I simply propose to give my own ideas, as the result of personal observation and experience.

What is stock breeding? What constitutes a stock breeder, and who shall be regarded as the *breeder* of an animal? The breeding of animals, is the coupling of diverse sexes to perpetuate the species; the breeder is the man through whose agency this is accomplished; a stock breeder is a party who makes this his business; and in this business, I think both theory and practice are requisite to a successful result. By this I mean, that some general knowledge of the animal economy, and also some practical common sense are essential. We should have, in breeding, a definite idea of what we desire to accomplish. If you are breeding cattle, combine as much as possible, beef and dairy

qualities; if horses, style, speed, size, endurance and docility; if sheep, docility, wool-bearing and mutton; if swine, good, quiet feeders, fine bone and flesh, size and early maturity; if poultry, be careful to control your fancy in selecting from the feathered tribe—if eggs alone are desirable, select some of the smaller non-sitters, such as the Black Spanish, White Leghorn, Black and White Poland, Bolton Grey, or Hamburgh; if poultry is your principal object, select some of the Asiatic fowl that have been bred with care and properly acclimated. The hen fever has been very prevalent for years, upon both continents, and even in our quiet New England; for which no specific remedy has been found. If the fever leaves the patient, with his stock producing a reasonable amount of large eggs, sitting a respectable portion of the time, ready for the epicure with reasonable notice, somebody's panacea has done its work at the rate of $10, $20, $50 or $100 per trio.

By first principles I mean, still further, that any man would be very unwise to attempt to rear an eight feet bullock, or a 3000 lb. cow (to exhibit at Smithfield market, or a State fair) in a goose pasture, or to expect that his Jersey, Devon, Ayrshire, Kerry, Hereford, Holstein, or Short-horn cow, would yield 10, 15 or 20 pounds of butter per week upon meadow grass or swale hay, or that with all the care and skill possible he could produce from natives, or even grades, such animals as can be found in this State, amongst the Jerseys, Devons, Herefords, Ayrshires, Holstein and Short-horns, at have been bred from thorough-bred animals. Hence, some of the absolute essentials are:

First, to breed thorough-bred animals. Both sire and dam should be of undoubted purity, with an unquestionable pedigree, and themselves as near perfection as possible.

Second, to breed grades, the sire should be of the above class, and the best dam that can be produced under the circumstances.

I regard the first intercourse of the male and female of really more consequence than any subsequent, for the reason, it has more influence upon all future progeny. There are numerous instances upon record, in support of this opinion. For instance, a thorough-bred mare had intercourse with a jack; the result, of course, was a mule. In after years a mule cropped out as the result of connexion with a thorough-bred horse. Very many cases where the result has been the same, with cattle and sheep, might be named. Hence, we see the importance of great care in this

direction. The intercourse should be under the most favorable circumstances possible, free from all excitement, mental and physical. I am fully convinced that the condition and treatment at this time and the few months following conception, affects the offspring for *weal* or *woe* in all coming time. At and from this time the dam should be kindly cared for, properly fed upon nutritious food, to prevent undue exhaustion of the system while carrying her young. I think but very few, even of our most intelligent men, realize what unkind treatment our domestic animals receive at our hands during this time, all the result of poor treatment. I regard the birth as the most critical period, to both dam and offspring, yet how little care is bestowed upon farm stock at this time. How many, otherwise intelligent men, neglect their domestic animals, regarding them as brutes, hardly needing our kind treatment; the result of which is, they suffer for food, water, warmth, cleanliness, and even *pure air*. They droop and die, prematurely, from such treatment. Their owners are quite surprised, and never for a moment mistrust that they alone are responsible; but condemn the stock, curse the breeders, denounce breeding generally, and leave the country in disgust for one where poor dumb brutes will live and grow large and fat without food or care.

I venture my opinion upon feeding young animals from birth to maturity. Nature designed the milk of the dam for its young while at the tender age, too young to graze. After that, sweet tender grass, or early cut, well-cured hay, from such grass, contains all the elements to form bone, muscle, and fat; unless the soil producing such feed has been deprived of some of those elements by continued cropping. If these are supplied in suitable quantity and quality, we may, with certainty, expect first class results.

You will doubtless ask, what are the requisite first principles? I answer, first class animals to start with; those inheriting the qualities we desire to perpetuate, and those qualities apparent by the general structure of the animal, and a first class pedigree. In other words, first-class, thorough-bred animals.

What is a thorough-bred animal, and what is a pedigree? Thorough-bred means pure of its kind, separate and distinct from all other breeds or races. Pedigree is a family record of this fact for reference, such as every well regulated family has, or should have, in their Bible, of themselves and their ancestors for generations past, that posterity may know who their illustrious ancestors

were. A native or scrub is such an animal as we find wild upon the western prairies, in Texas, and even in some portions of northern Maine and Canada, and not unfrequently do we find them in droves, taken through this State, to supply some of our farmers with such stock as they desire. What is a grade? A thorough-bred of some kind bred to a native. The result would be a grade, or half blood. A high grade is the result of a thorough-bred, bred to a grade. The further we advance in this direction the higher the grade, so that frequently the thorough-bred sire transmits his perfection so distinctly to grades, that it requires very careful discrimination to detect the impurity, and for most practical purposes, such animals are valuable. You will readily perceive the uncertainty of this line of breeding. From some unseen cause the alloy will predominate and a scrub will crop out, and you have in the same herd, a Hereford and Jersey steer—one girts five feet, the other seven; a Short-horn bull and a Kerry cow—one a mammoth, the other a pocket edition; a magnificent Holstein and a delicate North-Devon; a Shetland pony from the same dam with a Normandy; a Merino and Cotswold, twin-sisters; a White Chester, Black Essex, and spotted Berkshire, all in one family; White Leghorn, Black Spanish, Buff Cochin, Light, and Dark Brahma, Bolton Grey, Hamburg, and Chittagong, all from one brood. I have carefully observed, recently, one instance in breeding grades, which illustrates my point. While looking over the stock of an intelligent practical farmer, my attention was called to a pair of two year old steers. One was a half blood Devon, and the other a half blood Short-horn cow, both sired by the same pure blood Short-horn bull. The smaller one was much the best calf at three months old, and the first winter ate one quart of oats per day more than his mate, and since then, had taken one quart of meal per day more, and still is eight inches smaller in girth than the one from the grade Short-horn, both being in fine vigorous condition. Now, Mr. President, is it desirable or economical to herd thus indiscriminately? If not we will go back to just and correct principles, and direct our energies to some point and purpose.

I have had but slight experience in breeding colts, still I give my opinion that they should take the milk from the dam until from four to six months; calves, from three to six; lambs, from three to five; and pigs, to six weeks. Calves should be taken from their dams at a few days old and made to drink half the new milk until six or eight weeks old. It should be increased gradually for

a few weeks, after that all the milk should be taken until from four to six months. If early maturity is desirable, either for market, show animals, or early breeding, some more concentrated or stimulating food should be given. Caution should be used when the milk is taken from all young animals, to supply its equivalent in suitable quantity and quality, such food as will form bone and muscle largely, being essential. I regard ground oats, Indian meal, and shorts, in equal quantities, with all the fresh, sweet grass or sweet hay they will eat, as suitable food to mature farm stock for usefulness. This, with gentle exercise, kind treatment, pure air and water, with the requisite first principles I have named, will most certainly insure uniform results in the various directions in which we decide to breed.

I shall doubtless be asked how shall we continue this work of breeding? Shall we breed animals together from the same family; in other words, shall we breed in and in? I reply, in no case, unless to perpetrate desirable qualities to be obtained from no other source, and then only with the greatest care. To illustrate, suppose you possess a remarkable cow in some respects, dairy qualities, size, constitution, and docility; yet very defective in others, such as garget, rough coarse hair, sadly wanting in the crop, loin and brisket, it would be wonderfully strange if the offspring from brother and sister were perfect, or even as good as their parents. To counteract this tendency, I would select a male remarkably good in these points, even if he had other imperfections. Again, suppose some of these animals be taken to different localities early in life, fed upon different food, surrounded by different climatic influences, bred with other families of thoroughbreds, these tendencies to imperfection corrected, I would not hesitate to restore them to their former home for breeding purposes. Finally upon this point, I remark that in and in breeding should be practised only by those who well understand animal physiology, and then in extreme cases. You may ask, why did the Collins Brothers and Mr. Bates practice this? I will ask you, why did Adam and Eve couple together? You will reply, from the force of circumstance. I reply, so did the Messrs. Collins and Bates. There were no other men or women, neither were there other herds to select from as there now is, in the old and new world.

At what age shall we use animals for breeding purposes? The nearer maturity, the better. Ordinarily a stallion should not be

used until four years old; a mare should not breed until the same age; a bull not until two, and a heifer three years; a buck not until one, and a ewe not until two years old. At these ages these animals are sufficiently matured to transmit their constitutional qualities to their young. I am fully convinced, from observation and experience, that one of the greatest causes of degeneracy is the permature and excessive use of animals for breeding purposes.

Can we combine in the same animal, or family of animals, beef and dairy producing qualities? I think we can find in all races or breeds of cattle some families more inclined to dairy qualities than others, while they possess all the constitutional vigor of those less inclined to the dairy. The bull should be selected whose sire and dam inherited both dairy qualities and vital force, and had been bred and fed to develope both. This bull should be bred to a cow from another branch of the same family, inheriting and possessing the same inherent qualities. The cow should be fed (for months before copulation, and while yielding milk) upon nutritious food, to sustain the draught upon the system; also to develop the lacteal organs, and should be milked until near dropping her second calf, as her habits formed thus early in life will become second nature. In after years, when her organs are matured, she should be dried off two or three months before calving, to retain and assist her physical force. If this course is carefully and intelligently pursued, the result will be a combination of beef and dairy qualities in the same animals. I know quite well, that very many dissent from my opinion, from the fact that they do not consider the wonderful drain upon the system by yielding eight, ten, fifteen, or twenty pounds of butter per week, for eight, ten, or twelve months in succession, and at the same time producing a calf every year. Let us look, for a moment, at the difference between this cow and one that yields but half as much, and for but one half the time. Should we not come to the conclusion that it would be a very remarkable cow that would lay on fat and be in condition to exhibit, during such treatment?

Now Mr. President, I contend that upon the same principles, a horse may combine size, style, speed, docility and endurance; the sheep may combine size, early maturity, heavy wool-bearing and nice mutton; the swine may combine size, fine bone and flesh, docility and early maturity; and even fowl be bred to produce an abundance of eggs, and at the same time, make poultry good

enough for a farmer, and if good enough for him, for the vast multitude dependent upon him.

The fact that an animal has a good pedigree, is not always a sure guarrantee that his get will be first-class. Some of your sons and daughters may have descended from the best of families; they may, if you please, have a splendid pedigree, but they may have strangely fallen,—become dissipated and reckless, and their children may be following in their footsteps,—in morals and intellect, a disgrace to their ancestors. If humanity does thus degenerate, why may not poor dumb beasts, by abuse and starvation, until scarcely a germ of purity remains? and as like begets like, what can we expect in such cases?—hence, intrinsic value is not all in a name. A word here to those who argue that there is no real difference in animals,—that the feed makes all the difference, and that the prices obtained, are the result of deception by the breeder or vender. Now suppose you select the most vigorous pair of Kerry, Hereford, Holstein, Short-horn, Devon or Jersey cattle, and place them in the hands of the most skillful breeder, upon the most luxuriant feed for five years. Have you changed their general characteristics? Do they not retain their original character? Again, select a pure native cow, small, mean, rawny, crooked and ugly; breed her to a first-class thoroughbred bull. The result is a half blood grade; being bred to another thoroughbred, you get a three-fourths grade; another cross, and you have a seven-eighths grade, and so on. Have you not, during this process, lost nearly all the distinctive features of the native cow? Would not this stock sell in any market, for from fifty to seventy-five per cent. more than the original stock? If so, why this assertion reflecting upon the integrity of the breeder, and a thrust at improvement? If this whole system of scientific breeding is a swindle, what a vast multitude are being swindled, and have been for the last century, by paying from $1,000 to $50,000 for horses, from $1,000 to $40,000 for cattle, from $50 to $1,500 for sheep, from $100 to $500 for swine, and from $25 to $200 per trio for fowl.

Perhaps I have not dwelt sufficiently long upon feeding. I find that gentlemen of the horse fraternity, do not agree upon the question of feeding of colts and mares. I am not really a horse man, but I will *score* a little here. I think even if the colt is all right in wind, limb and constitution at weaning time, he may be made very good or good for nothing, by proper or improper

feeding. Some contend that they should eat *no* grain, others, that they should have four quarts per day, or all they will eat; I think more are spoiled for want of oats, than by eating them. They should have all the sweet grass or hay they will eat; from one to two quarts of oats per day should be given the first year, according to age and exercise, and should never be kept close upon a hard floor. Corn or Indian meal should be withheld until their bones and muscle are matured; after that their feed should be adapted to their labor. If for the race-course, feed sweet, clean oats freely, and sweet hay in small quantities; if for heavy work, more hay and corn or meal, to keep the horse in good condition; they should be fed at regular hours, and no hay ever be left in their manger.

I will consider for a few moments more, the feeding of cattle. Those designed for breeding purposes should never be made excessively fat, lest the milk secreting, and reproducing organs become distorted, and the female become nearly worthless as a breeder and dairy cow, and the male worthless as a stock getter. I regard clover, red-top, and herdsgrass as the basis of feed for horses, cattle and sheep, and as we reduce this, we should supply its equivalent to maintain the equilibrium of the system. What feed shall be given? In other words, what is the relative value of corn, oats, barley, peas, beans, turnips, potatoes, oats, barley, rye and wheat straw, linseed and cotton seed meal. By consulting various chemists, the following, is an average analysis, sufficiently accurate for all practical purposes, of the values of different feeding stuffs:

Equivalent to 100 pounds of first-class hay:

383	"	oat straw.
460	"	barley straw.
479	"	rye straw.
460	"	wheat straw.
319	"	potatoes.
382	"	carrots.
676	"	turnips.
70	"	corn.
65	"	barley.
60	"	oats.
27	"	peas.
23	"	beans.
22	"	linseed and cotton seed meal.

You will readily perceive that the roots contain a large amount of water, a small amount of nitrogen and nutritive matter; so does straw. Hence, when we feed them instead of hay, some of the more concentrated foods should be given to furnish nutritive matter. This might be supplied, in part, by cutting the grain greener, when the straw would be more like hay, and the grain equally valuable to feed, especially if ground and wet. Our domestic animals require and relish a variety of food as much as we do, and they should have it if possible. Every intelligent, observing man, knows that the condition of the animals and the circumstances under which they take their food, are so varied that absolute certainty, as to quantity or quality is quite impossible, yet we may, with proper care, approximate so nearly to certainty that ruinous losses may be avoided.

In conclusion, I think we may safely and economically adopt a few general rules which will be a safe guide for the farmer in his breeding operations, viz: select breeding animals with great care and none but the very best our circumstances will justify. Treat them kindly, and feed them generously upon sweet nutritious food. Carefully discriminate between good and poor food, a pure and poisonous atmosphere, pure and impure water, kindness and abuse, sunlight and darkness.

Now, Mr. Chairman, I have not intended (in my hasty general remarks,) to go into details, but as I am presumed to represent the State Agricultural Society, I have endeavored to deal in, or illustrate general principles, which may be reduced to practice in all portions of the State. I am fully conscious of the magnitude of this subject, and of my incompetency to do it justice, still I hope to have provoked my brethren of the agricultural persuasion, to practice upon any good suggestions I may have made, and contradict my absurdities.

A brief discussion followed the reading of Mr. Percival's paper,—participated in by several members of the Board and other gentlemen, at the conclusion of which, the meeting adjourned.

AFTERNOON SESSION.

The Convention met at 2 o'clock P. M., the President in the chair. The afternoon was occupied by the reading of a paper on

Special Farming.

BY Z. A. GILBERT, MEMBER FROM ANDROSCOGGIN COUNTY.

There is no one reform that will contribute more to an increased success of farming, than will a more rigid system of *Special Farming.* Two many of us are still bound to the system practiced long ago, when the object sought for, and the only object, was to produce for the wants of the family. New conditions have compelled us to deviate from that system, to a certain extent—though it has been done with extreme reluctance—but not to that extent which would be of the greatest benefit. Special farming is a highway which will lead us out of many of the embarrassments now encountered, and place us on the road to a still greater sweep. There are many reasons for making our farming more special, some of which will be alluded to at this time. In advocating special farming, I would not be understood as recommending a system, strictly and entirely special, although this may be advantageously carried to a far greater extent than may at first appear. The system of special farming, I urge upon your attention at the present time, is that some one of the many branches of mixed farming be selected and pursued as a specialty, as a business, from which to realize an income, while at the same time many of the necessary products for home use are grown in sufficient quantities for that purpose. Wherever this system is introduced, however, the specialty, in the course of time, is carried to a greater extent than I here recommend. Scarce a milkman can be found who makes his own butter and cheese. Nearly all the products of his farm are devoted to the production of his special product. Many dairymen who send their milk to the cheese factory, buy all the butter used in the family; while in butter dairies, generally the cheese is purchased elsewhere. Market gardeners never make butter or cheese; they grow little but garden truck. So it will be seen that the change I recommend is not so radical as experience will prove desirable. I know the argumant will be met with the oft repeated statement, that it is better to raise a little of this and a little of that, to keep a little of all kinds of stock, and so have a little of everything, that in the variableness of the seasons and

in the fluctuations of prices you will hit aright somewhere, your porringer will not be entirely empty, if a singhe crop does fail. Now, gentlemen, a farmer never prospered by basing his farming on failures. The fact is, with good farmers there are no failures. When a farmer produces a little of everything he never becomes skillful in any direction. His products never sell for the highest price. A profit from any production whatever, must and will count, if it is realized at all, from the sale of choice articles. A fruit grower never will grow rich from the sale of wormy apples and knobby pears. Choice fruit may be grown, by skillful hands, from the same tree which now bears that which is nearly worthless, and a score of specimens of the former will sell for as much as a barrel of the latter, and will always find a ready market. Thin beef sells for six cents per pound, and fat for twelve. A pound of inferior butter sells for fifteen cents, and the purchaser wants no more; and a pound of choice for fifty, and costs no more than the other. If a farmer would realize a handsome profit, he must exercise the requsite skill to produce a first class article. More and more every year is skill demanded in all our farm operations. For instance, it was but a few years ago that a lamb, ready for the butcher on the fourth of July, was considered very early, and in consequence brought a round price; now lambs are plenty at that time, and if you would obtain the highest price, you must have them ready for the market in May, when they will sell any year for twenty-five cents per pound. It is not an easy matter to grow a flock of lambs ready for the butcher in early spring. It requires skill; a man must know how. If you don't believe this try it, and you will be convinced. This illustrates the whole catalogue of farm productions, and need not be farther extended.

Now a man who divides his attention among many products, and produces but little of either, never becomes skillful in any direction, and never obtains a fancy price. Experience proves this, however intelligent a farmer may be,—however smart in the business transactions of the farm, he *does* not and *cannot* become skillful in the production of choice products, when his attention is divided among a little of everything. The laws which govern productions are so intricate, that the life-time of our smartest men is none too long, in which to learn how to pursue even one of the many branches of farming, with that success which is rewarded by the production of a uniformly choice product. Our distin-

guished fruit growers have made their chosen business a life study; and for this devotion to a single interest, they have realized a generous reward, and future generations will be benefitted by their labors. Had the little of everything policy been adopted by them, who would ever have heard of a Downing, a Barry, a Thomas, a Wilder? Is not the work they have accomplished, the good they have done, sufficient for a life time of study and labor? In the noted dairy regions of the country, able men are giving their undivided attention to building up and perfecting that one interest. The laws which govern the flow of milk, and the conditions which control it in the various processes through which it passes in being worked up into commercial products, are as carefully and as ably studied, as are Coke and Blackstone by the law student. It is by this undivided attention to a single interest, that our American cheese has acquired its reputation, and the markets of the world thereby opened for our product. Yet perfection is not reached, either in production or manufacture, and other able men giving it special attention, will reap their reward in the quantity and quality of their own products, and the benefits they will confer on mankind. Stock breeders find a lifetime all too short in which to learn the laws which govern reproduction. The principles of breeding and the rearing of stock alone are sufficient to engage their whole attention. It is by this undivided application of the abilities which they possess, which has so fully established the distinguishing characteristics of the different breeds of stock. The mild, intelligent eye, and delicate structure of the Jersey cow, speak the long continued special application which has given our epicurean tastes, golden balls of fragrant butter. The straight outlines and square figure of the Short-horn, are architectural designs drawn by hands made skillful by long years of application to a single object, and perpetuated only by the same skill and by the same application which first shaped their proportions. The skill manifested by the distinguished breeders in this State, as well as in the country at large, was acquired by an application to a single purpose. That this devotion of their time and of their talents to a single object is being well rewarded, no one will for a moment question.

By applying himself principally to the production of a single product, the farmer not only becomes skillful in the production of a first class article, but at the same time he produces of that article an increased quantity, which renders it still more desirable

that it be of high quality. When but little of any product is produced, it matters little whether it command a high or a low price; but when the income depends upon that product alone, profit or loss turns the balance, as your products command a high or low price. One is therefore continually spurred on to greater efforts in obtaining that higher price; he studies the markets, that he may know the best time to sell; exerts himself to find where he can sell to the best aavantage. Since he has much to sell, it pays to devote time to the matter. If the quality of the product is good, the market is always open to him at premium prices; he soon acquires a reputation which raises the premium still higher. This reacts upon him, and he devotes still greater energy to production. High prices and big profits, gentlemen, are mighty incentives to action. This reputation which never comes only through skill in special directions, is worthy of being sought for, for financial reasons if for no other. A Sargent can sell all the butter he can make at a dollar a pound, because earnest attention in that direction has enabled him to acquire a reputation for making a uniformly choice article. A Wilder sells his pears and plums for a dollar a dozen, for the purchaser knows he gets choice fruit. Samuel Campbell sells his Duchess cows for thirty and forty thousand dollars each, because they are worth it, and the Short-horn breeders of the world know it. In our own State the same principle is at work, though as yet, on a somewhat smaller scale perhaps. Butter makers I know, who sell their products for fifty cents per pound, year after year, while their neighbors sell for twenty-five. Our breeders are selling representatives of their herds for prices envied without doubt by many of their neighbors; prices which their skill and their reputation as breeders have placed within their reach. Any of you, gentlemen, through the same means, can acquire the same position. Some of these boys who are now listening to me, learning lessons set before them by worthy example, will rise to even higher success than have the individuals whose example they are now endeavoring to follow; but that success will come, as it always does and always has, through undivided attention to a single object. Again; the high price of labor, and the sharp competition occasioned by facilities for transportation from one section of the country to another, leave so small a margin for profit that it becomes necessary for the farmer to avail himself of every available facility for reducing the cost of production to the lowest possible figure. In order to

do this, the old method of hand power for all kinds of work must be laid aside,—improved implements must be supplied, that far more can be accomplished with a given number of men, than was necessary when labor was cheaper and plentier. In short, it must be the aim to accomplish a given amount of work with as little man-power as possible, This of course implies the use of costly machines; it is simply substituting capital for labor. But capital has its price as well as labor, so that even here the outlay should not be unnecessarily large. If the old system of mixed farming is followed it becomes necessary from the conditions above alluded to, to fit up with a full complement of machines and tools for carrying on each of the several branches of farming practiced, and to arrange buildings and fit up conveniences for the same. All of this would require a larger capital than could be properly invested in a small business. Idle capital earns no more than idle hands; better by far pursue a single branch, with all the outfit and all the conveniences and arrangements necessary to carry it on with ease and dispatch, and thus make the invested capital return its rate per cent. This high price of labor revolutionizes everything performed by labor, and we must conform to the changes, or *live* as people were obliged to, and *do* as they did, when the price of labor was low.

Where the system here advocated is adopted, it becomes more than ever necessary that the soil and crops be adapted to each other. Mr. Willard said, truthfully, at the Farmers' Convention, at Farmington, that "many of our failures come from the misdirection of soil capabilities." We see illustrations of this in every neighborhood. A soil will not produce crops not adapted to it. When specialties are pursued there must be no failures. Fruit growers have learned by experience that efforts to grow apples and pears, in Maine, in low valleys, will sooner or later prove disastrous failures. The cheese factory should be erected only where green fields and luxuriant pastures furnish an abundant supply of sweet grasses. The shepherd may take his flock to the rough mountain pastures, and the herdsman his cattle to the rich intervals. It is useless to attempt to grow garden truck upon a muck bed, or three tons of clover upon an acre of sand. Some extended sections are particularly adapted to the production of a certain product. Cape Elizabeth excels any other section of the State in the production of cabbage, as the hills of Oxford excel in maple sugar. The farmers of that town therefore wisely make

that vegetable a specialty. A single farmer, last year, grew fifty tons on three acres of land, and sold the product at forty dollars per ton. The value of the crop in the town was estimated at a hundred thousand dollars. Three hundred thousand barrels of apples in one year, grow in a single town in New York. Extensive sections of the Connecticut river valley are devoted to the production of tobacco. Onions are a specialty among the farmers of a whole township in Massachusetts. The Mohawk valley, in New York, and the Champlain slopes of Vermont, are as exclusively devoted to dairying as are the northern regions of Maine to timber. By thus adapting a production to its own particular soil, and locality, and making that product a specialty, the cost of production is reduced to the lowest possible figure, success is assured, and the profits arising from the business are larger and more certain of being realized than can possibly be the case when prosecuted under less favorable conditions.

The time has come when *business principles* must be applied to farming, if we would meet coveted success. Business principles are just as appliable to farming, and their observance just as necessary to success, as in any other branch of business, whatever. A man in any other business, when he finds an operation is not bringing a profit over cost, suspends such transactions at once, or goes on to utter failure. Farmers, from the nature of their business, seldom fail, as the term is used in business circles. That farming can be conducted with a total disregard of the principles which govern all business transactions and bring no failure, is positive proof that by a close observance of those principles it may become exceptionally profitable.

Without some system of farm accounts, a farmer is unable to tell whether his business, as a whole, is profitable or not. He knows he receives some money, and he knows, to his sorrow, when the last dollar is paid out. If he finds the disbursements are greater than the income, he knows not where the difficulty lies. He is unable to tell whether any particular branch of his operation is paying him richly or running him in debt. He guesses things are so and so; but from actual figures, knows nothing about it. The first step then towards introducing business principles into the business of the farm, is to adopt some system, rough though it may be, of farm accounts. There is no trifling matter that will tend so much to reform as this. Leaks will be discovered and stopped; unprofitable operations discontinued;

and those which prove profitable will be pursued with increased earnestness. It will show to the operator just where are the profits, and where the losses; and thus will tend directly to the adoption of specialties. No man will carry on unprofitable work when he *knows* it to be such.

Above all things else our business needs to be systematized. It is true that system is not so easily adopted in farming as in manufactures—that is, it cannot be so rigidly carried out—yet to a far greater extent than is now the case can it be introduced. In the earlier days of the settlement of our State, the wants of the people were comparatively few and simple, and they were compelled by circumstances to supply those wants chiefly from their own resources. This led to the adoption of a mixed husbandry; and under the conditions by which they were then controlled, was the true policy. System, and the division and subdivision of labor could then hardly be introcuced into the limited manufactures, much less could it be in farming. The shoe-maker not unfrequently tanned his own leather, made the pegs he used, cut, stitched, and bottomed his shoes, all the work was done by himself and by his own hands; now we have no shoe-makers—we have cutters, lasters, &c. Yet, are we not trying, at the present time, to cut, stitch, and peg our farming? Look at manufactures to-day and see how business is conducted. Everything is systematized so that every outlay shall bring the largest possible returns. Go to the shoe manufactory and see how systematically everything is arranged for each workman to perform his particular part of the work with the greatest dispatch. No man makes a whole shoe now—one lasts it, one with a machine pegs it, another heels it, and so on till the shoe is completed. Each workman performs a single part and that alone. Go to a mowing machine manufactory where you will find one workman drilling, one filing, one cutting screws, one turning, one planing, and so on through the whole list, till the whole comes together in the complete machine. Each man does his particular part, and that alone. So in the slaughter house of the west, each man will work at his particular part and without change from morning to night, day after day, and week after week. Each one thus becomes expert in his particular part of the work, and it is performed at the least possible cost. How would a manufacturer succeed, at the present time, if he set a single workman to making the whole of a shoe or of a mowing machine, and then place his article in competition with those man-

ufactured where the work was systematized? Yet, this is just what many farmers are trying to do. Who hears a farmer say anything about systematic application of work, for the purpose of reducing the cost of production? Special farming admits of this far more than mixed farming. A manufacturer would surely fail in an attempt to manufacture a score of different articles all with the same machinery and with the same workmen. Go to a scythe factory, and you find the principle I would enforce, fully illustrated. A single workman shapes his steel with a hammer, wielded by an arm that never tires,—whose name is not entered upon the pay roll, and whose appetite does not respond to the call of the dinner bell,—and shapes it, too, with a rapidity and an exactness which alone can be reached by the system and force there employed. How would a man succeed who, upon another anvil would attempt to mould the same steel into like proportions with a hammer wielded by his own right hand, strong and willing though it may be? The resulting commodities go into the same market and will return to each a like sum of money. While the one, from the appliances brought to his assistance, can realize a large income for his labor, the other, whose labor accomplishes so little, receives only a corresponding amount. He receives for his labor a compensation for all that labor accomplishes;—the other receives no more. The difference is in the application of that labor by which one is enabled to accomplish more than the other.

A similar fate would await him who would be so short sighted as to set up a full set of machinery for the manufacture of several different kinds of goods, and while engaged in the manufacture of one, allow all his other costly machinery to lie idle and earn him nothing. Can any one with such management, put either of his different kinds of goods in competition with those of his shrewder rivals, who keep their machinery running all the time, and of course manufacture at a cheaper rate? Yet this is what the mixed farmer must do.

Associated dairying, which is now being introduced into the State, is a step in the right direction. Its advent is the beginning of a new era for large sections of the State; with it comes just that for which I am arguing. Dairying will as surely be made a specialty, as the factory is introduced. Here, too, work is systematized—machinery is used, costly appliances supplied. By these means, one person can accomplish as much as a dozen could without them; he accomplishes in the manufacture of cheese, just

what the workman at the forge with trip hammer and die accomplishes in the manufacture of scythes,—the cost is lessened. No dairyman in the reach of a factory can work up his milk at home and put his cheese into the market with that from a factory, no more than a man can make scythes and forks at a profit with a hand hammer. Machinery must be employed; and with but a half dozen cows, all these costly appliances are beyond his reach,—it costs too much money for the amount of business done; too much capital is invested. He must do the work himself in the old fashioned way, and realize the old time reward, or systematize the work by associating with others. The old fashioned reward is now considered small pay; and this small pay does not answer the demands of the time in which we are now living.

Another strong argument for special farming,—and the final one at this time,—is that the cost of marketing is greatly reduced. When the mixed farming is practiced, it not unfrequently occurs that small quantities of a product are allowed to waste, or are sold at home for a trifle, because the quantity is so small that it is not worth carrying to market. Many a man goes to market, when a few pounds of butter and a basket of eggs is all that can be mustered. With this small quantity he goes ten or fifteen miles, requiring a full day for himself and his team; and when he returns brings little, if any, more money than would have been obtained by working the same length of time for an enterprising neighbor who practices special farming. How much of our available labor is absolutely wasted in going to market. The farmer who directs his attention to a special product, when he goes to market, takes a full load because he has it to take, and a very small percentage of its value, instead of the whole product as in the other case, compensates him well for the time required. Too much valuable time,—or that which should be made valuable,—is spent by the common farmer in getting to market the necessarily small quantities which are the direct result of the erroneous system followed. We *must* learn to economize labor; we *must* systematize our business; we *must* realize a better per diem for our work on the farm, than such management brings us, or the desertion of farms which should and may be comfortable homes will continue, and the rural population continue to decline as the years go on. Prosperity does not and cannot now follow in the paths which led our fathers' to success. New conditions demand

of us different efforts; by system, by order, by labor well directed to special objects, by an intelligent and faithful application of our highest powers to the work placed before us, we shall be enabled to go on to prosperity. Look our broad State over, and you cannot now point to an individual who does not owe his prosperity to a devotion to a single purpose.

And to you, gentlemen, farmers of Aroostook county, the system here advocated is especially commended, in the full belief that you would be benefitted by its adoption. To no other section of our State is the system more applicable, nor is their any other in which greater benefits would flow from its adoption. And you who are now listening to me, if you would enjoy a life made happy in a home made pleasant by a liberal outlay of means at your disposal, are earnestly commended to a careful consideration of the subject which I have thus briefly brought to your notice.

Hon. George B. Barrows, member of the Board from Oxford county, then made a very neat and appropriate speech, in which he introduced a series of resolutions, thanking the people of Houlton for their interest in attending the meetings of the Board, and for giving free entertainment to the students of the State College; to the Aroostook Agricultural Society for providing the free use of the hall in which to hold the meetings; to the Houlton Band for its compliment to the Board; to Hon. M. H. Angell, manager of the European and North American Railway, for the free transportation of the students of the State College over his line, and to the several railway and other lines of transportation who allowed half fare rates to those attending the convention. The resolves were feelingly responded to by Hon. J. C. Madigan, and then given passage by a rising vote. After this, the Board adjourned without day.

CHEESE FACTORIES IN MAINE.

With over twenty cheese factories in operation in Maine, and six or eight more companies already organized, or preparing to commence operations another season—the system of associated dairying, which has received considerable attention from this Board, and which has been urged as one of the specialties of farming peculiarly adapted to Maine, may be said to have become well established in our State. The greater part of these associations have been in operation but a single season; but their success has in every instance been satisfactory and encouraging, and without doubt, more factories will continue to be put in operation in the future. There can be no question that in good grazing sections, the introduction of cheese factories will realize to the farmers larger returns for the food consumed by stock, than is now obtained by the course of low, mixed farming, generally pursued. In the following returns, the small number of cows to each factory is noticeable; in the great dairy sections of New York and the west, and indeed, in most sections where associated dairying is largely engaged in, the factories average four to six hundred cows; and Mr. Willard says "the milk of four hundred cows is the smallest quantity that can be employed, in order to obtain a fair living compensation for services,—while the milk of one thousand cows can be manufactured at but little extra expense, comparatively." In this view of the case, it is a question for our dairy farmers to consider—if they cannot increase the number of cows kept, reducing the other farm stock, with a good prospect of increased profits by so doing; especially in sections where cheese factories are already established or about to be started.

The Sandy River Cheese Company,

was the first company organized in Maine, for the manufacture of cheese. It was organized in April, 1871, and the building was put up in May of that year; its size is 28 by 32 feet, and a two years' occupancy has convinced the proprietors that it is not sufficiently large for the business. The factory went into operation

June 12th, 1871, and it has received, upon an average, the milk of one hundred and sixty cows per year, for the three years it has been in operation; it made in 1871, about 15,000 pounds of cheese, in 1872, 47,000 pounds, and in 1873, about 40,000 pounds; operations were commenced in 1873, May 26th, and closed October 11th; during which time the company received milk as follows: in May, 7,958 pounds; in June, 89,638 pounds; in July, 112,285 pounds; in August, 94,130 pounds; in September, 59,333 pounds; in October, 11,846 pounds;—total, 375,190 pounds. The cheese has been marketed principally in Portland and Lewiston, and has acquired a high reputation; price obtained, fifteen cents per pound. The company is a joint stock association, with shares at fifty dollars each; cost of making cheese, (including interest on stock,) two cents per pound; average weight of cheese, fifty pounds each. The building and fixtures cost $1,656, including one half acre of land, and the expense of bringing water about fifty rods. The building is located in the town of Strong, and the present organization of the company is as follows: President, C. H. Vining; Treasurer, S. Morrell; Secretary, J. Mitchell; Directors, J. R. Norton, C. H. Vining, T. B. Hunter, J. T. Skillings, J. Mitchell; Superintendent of Factory, in 1871 and 1872, O. S. Norton; in 1873, A. A. Carvill.

Six Mile Falls Cheese Company.

This company consists of forty-one shares at fifty dollars each, and was the second cheese factory started in Maine. The building is located in the town of Glenburn, and the company first begun to manufacture cheese, June 13th, 1872. The operations that year closed October 12th. The building is 25 by 35 feet, two stories high, and is quite inadequate to the wants of the company; it is furnished with two Miller's vats of 440 gallons each. The factory commenced operations with but 1,556 pounds of milk; during the season of 1872, the following quantities of cheese were made for each month: In June, 4,950 pounds; in July, 11,640 pounds; in August, 9,540 pounds; in September, 5,760 pounds; in October, 3,150 pounds. The cheese was marketed chiefly in Bangor, at 14 to 15 cents per pound. The present organization of the company is as follows: President, Harris Bailey; Treasurer, O. Stockwell; Directors, H. Bailey, John M. Coit, Jeremiah Gilman; Superintendent, Daniel T. Orr. No returns of the operations of 1873 have been received.

South Newburg Cheese Factory.

This company was organized November 19th, 1872, and incorporated February 18th, 1873. The factory was built in May, 1873, and operations in the manufacture of cheese were begun June 10th. The company is a joint stock association, with one hundred shares at twenty-five dollars each. The factory building is 34 by 50 feet, with four floors, and is furnished with one of Ralph's Oneida Cheese Vats. The factory closed operations September 15th; the average number of pounds of milk received per month, was 85,000 pounds; the cost of making cheese was two cents per pound; the average weight of cheese, 45 pounds; most of the cheese has been marketed in Bangor, at fourteen and one-half cents per pound, although it has not all been sold, and no return of the total number of pounds of cheese made, has been received; the milk of 145 cows has been received at the factory. The officers are: President, B. D. Newcomb; Treasurer, J. U. Piper; Secretary, E. F. Piper; Directors, James H. Sawtelle, Charles Croxford, George W. Snow, Doane Newcomb, B. D. Newcomb; Superintendent of Factory, William Welch, from New York.

Kenduskeag Cheese Factory Association,

Organized March 1st, 1873, by choice of William Higgins, President; T. P. Bachelder, Secretary and Treasurer; Chester Weld, William E. Atwood, F. D. Judkins, Directors. The factory building, which is 32 by 60 feet, was built in June, and the factory went into operation July 30, 1873. The vats were made at the factory, and are of the pattern sold by Charles Miller & Son, Utica, New York. The factory closed September 27th, and during the time it was in operation, it received 144,861 pounds of milk from which 16,000 pounds of cheese were made, the cheese averageing 38 pounds each. The company purchased the milk manufactured, paying for it one and one-fourth cents per pound. The cost of making the cheese was two cents per pound; about 400 pounds of the cheese made has been sold in Bangor, and the company still has some on hand; fourteen and one-half cents per pound having been obtained for that sold. The shares of the company are $100 each. Arthur J. Finn, from one of the Herkimer county (N. Y.,) factories, is Superintendent.

Monroe Cheese Factory.

This company was organized in March, 1873,—shares, $10 each. Willard Cates, President; Freeman Atwood, Vice President; E. H. Neally, Secretary; C. Dolloff, Treasurer; D. Dolloff, F. W. Ritchie, P. H. Kane, Directors; factory, 30 by 50 feet, and furnished with an Oneida vat. The company met with some discouragements at starting, by which nearly a month's time was lost. Operations were, however, finally commenced on the 17th of July, and the factory closed September 27th; having received the milk of one hundred and fifty cows, and made 18,868 pounds of cured cheese, from 186,016 pounds of milk; cheese sold for 15 cents per pound; cost of making, one and eight-tenths cents per pound; average weight of cheese, 45 pounds. J. H. Ostrander of New York, Superintendent of factory.

Weld Corner Cheese Factory,

Organized in April, 1873, by choice of William S. Robertson, President; Major Phillips, Vice President; A. G. Taft, Secretary. Shares $25 each. The factory building was erected in May, and is 30 by 50 feet, furnished with a Ralph No. 15 vat. Factory opened June 26th, and closed September 20th; receiving the milk of 125 cows; number of pounds of cured cheese made as follows: in June, 504 pounds; in July, 8,944 pounds; in August, 7,482 pounds; in September, 3,010 pounds. Average milk to a pound of cheese, 9 3-4 pounds; average weight of cheese, 43 pounds; cost of making, 2 1-2 cents per pound. Price received for cheese, 14 cents at factory. Oliver S. Norton, Superintendent.

Enterprise Cheese Company.—*Industry.*

This company was organized January 1st, 1873, in shares of $25 each. H. A. B. Kyes, President; J. A. Stover, T. Luce, A. H. Swift, W. D. McIntosh, H. Thomas, Directors. Building, 24 by 28 feet, erected in June, 1873, and furnished with a Ralph vat. The factory opened June 23d, and was in operation sixty-one days, making 700 pounds of cured cheese; cost of making, three cents per pound; average weight of cheese, 32 pounds; cheese mostly marketed at Farmington; price obtained, 15 cents. N. T. Strickland, Superintendent.

MEXICO AND EAST RUMFORD CHEESE FACTORY COMPANY.—*Located in Mexico.*

Company organized the winter of 1872–3, in shares of $25 each. S. Goff, President; Benjamin Stover, Treasurer; D. G. Frost, Clerk; William M. Blanchard, Daniel B. Austin, J. T. Hall, Directors. The building, which is 28 by 50 feet, with three floors, and furnished with a Ralph No. 15 vat, was built in May and June, 1873, and the factory commenced operations July 14th, and closed September 6th. It closed earlier than it otherwise would, but for the severe drouth which reduced the yield of milk. Number of cows furnishing milk for the factory, 100. Milk received in July, 29,740 pounds; in August, 46,071 pounds; in September, 7,643 pounds. Amount of cured cheese made in July, 3,300 pounds; in August, 5,119 pounds; in September, 850 pounds;—nine pounds of milk being required to a pound of cheese. Cost of making cheese, 2 1-4 cents; average weight of cheese, 37 pounds. Price obtained for cheese at factory, 15 cents per pound; marketed in Lewiston and Auburn. Fred A. Porter, Superintendent.

FARMINGTON CHEESE COMPANY.

This company was organized in April, 1873, and an act of incorporation will be asked for the present winter. Shares, $50 each. E. J. Dyar, President; G. W. Ranger, Treasurer and Superintendent of factory. The building, which is 26 by 30 feet, three stories high, was built in May and June, 1873, and cost, including the fixtures, $1,425. It is furnished with a Ralph's Oneida No. 15 vat, holding 550 gallons. Season of working, from June 23d to August 24th; during which time, 88,953 pounds of milk were received, being that furnished by about 85 cows. About one-half the cheese made has been sold at the factory, at 15 cents per pound, and the remainder was divided among the patrons of the factory at 15 cents per pound, November 5th. The cost of making is two cents per pound; weight of cheese 16 2-3, 23, and 32 pounds,—being made small to suit the local market. Concerning their operations, the Superintendent says: "We cut our cheese as soon as they were thirty days old, selling what we could at the factory up to November 5th. Had we used 3,000 to 5,000 pounds of milk per day, we should have boxed the cheese and put them into the market at the market price, at the time of

making; I do not think it profitable to hold cheese, as the shrinkage is generally more than the advance in price. We used rennets which we obtained from our home market,—curing a part of them ourselves,—preferring them to those obtained from New York or elsewhere; they make a much milder and better flavored cheese. Our make this year has been rather an experiment than otherwise. Many farmers had but little confidence in the undertaking, consequently we used but little milk; we think, however, that another season we shall more than double the amount of the make of cheese, and probably run five months instead of two, as we have this year."

MECHANIC FALLS DAIRYING ASSOCIATION.—*Name of Factory, "Dirigo."*

Company organized April 15th, 1873. Shares $25 each. A. C. Dennison, President; George Moore, Treasurer; J. R. Pulsifer, J. K. Demming, Joseph Farris, S. C. Hayes, George F. Thurston, Nelson Haskell, A. W. McCain, Thomas Cousins, Luther Perkins, Directors. The factory was erected in May and June, 1873, and is 34 by 99 feet, two stories high. The season of making was from July 3d, to October 11th. The milk of about 300 cows was furnished to the factory, with the exception of the month of October, when but 75 cows furnished milk. In July, 154,485 pounds of milk were received; in August, 132,827 pounds; in September, 99,973 pounds; in October, 2,372 pounds; making a total of 407,657 pounds; from which, 45,295 pounds of cheese were made, an average of nine pounds of milk to a pound of cheese. Cost of making, two cents per pound; cheese marketed at the factory, and consigned to D. W. True & Company, Portland, agents. Price obtained for plain cheese, 15 cents; for sage cheese, 16 cents; average weight of cheese, 50 pounds. George A. Robinson of Pawlet, Vermont, Superintendent of Factory. The return from this factory says: "In July, it would take about ten pounds of milk for one pound of cheese; in October, about eight pounds of milk to a pound of cheese."

DIXFIELD CHEESE COMPANY.

Organized early in 1873; shares $25 each. John B. Staples, President; A. P. Marsh, Treasurer; W. S. Eustis, Secretary; George G. Gates, Samuel White, William Waitt, Directors. The

factory building was erected the spring of 1873, and is 32 by 40 feet, having three floors. Furnished with Ralph's Oneida vat. The factory was opened June 2d and closed September 7th; receiving the milk of about 150 cows. Milk received as follows: in June, 78,066 pounds; in July, 80,744 pounds; in August, 62,997 pounds; in September, 8,145 pounds. Number of pounds of cheese made, 24,100; at a cost of two cents per pound,—nine and six-tenths pounds of milk being required to a pound of cheese. Price obtained for cheese sold, 15 to 16 cents per pound. Average weight of cheese, 40 pounds. L. C. Willoughby, Superintendent.

Brooks Dairy Company.

Organized fall of 1873. A. G. Rose, President; Benjamin F. Knowles, C. H. Neally, Vice Presidents; J. W. Lang, Secretary. Factory, 30 by 50 feet, now in process of erection, and to be ready for operation in the spring of 1874, when the milk of 200 cows is expected. Capital stock, $2,000, in shares of $25 each.

North Jay Cheese Company.

Organized March 1st, 1873. Shares, $50 each. J. O. Kyes, President; N. L. Phenney, Secretary; Lorenzo Kyes, Treasurer; J. O. Kyes, O. G. Kyes, S. R. Leland, Directors. Building, 28 by 45 feet, two stories high, erected in May, 1873, and provided with a Ralph's No. 15 vat. Commenced operations, June 11th, and closed September 27th; having received the milk of 150 cows. Milk received as follows: in June, 40,354 pounds; in July, 70,466 pounds; in August, 62,213 pounds; in September, 36,560 pounds; cheese averaging 40 pounds each, mostly sold at the factory at 16 cents per pound. Rawson Holman, Superintendent.

St. Albans Cheese Association.

Organized March 28th, 1873. President, N. B. Turner; Secretary, E. C. Buker; Directors, N. B. Turner, L. L. Lucas, B. R. Dickey, R. W. Webb. Building, 30 by 60 feet, with three floors, erected in April, 1873. It is furnished with a Ralph vat and heater combined. Commenced making cheese July 7th, and closed September 13th; receiving the milk of 110 cows. Average number of pounds of milk, received per day, 1,700 pounds; ten pounds of milk required for a pound of cheese; cost of making,

two cents per pound; average weight of cheese, 38 pounds. Price received for cheese at factory, 16 cents per pound. Shares in company, $50 each. A. S. Whittier, Superintendent of factory.

EAST JEFFERSON CHEESE MANUFACTURING ASSOCIATION.

Organized spring of 1873. Shares in corporation, $10 each. President, Luther M. Kennedy; Secretary, J. J. A. Hoffses; Treasurer, Samuel J. Bond; Agent, J. W. North, Jr., M. D.; Directors, L. M. Kennedy, J. W. North, Jr., M. D., Eben Hall, Erastus F. Weeks, Alison Bond; Manufacturer, Sylvester Vinal. Size of building, 26 by 50 feet, two stories high, and furnished with Ralph's Oneida vat. Factory opened June 23d and closed August 30th; received the milk of 110 cows,—but as many were farrow, and many calved late, and as some patrons did not begin to bring milk till about two weeks before the factory closed, it is estimated they were about equal to 60 fair cows. Milk received in June, 7,939 pounds; in July, 42,484½ pounds; in August, 31,836 pounds. Amount of cured cheese made in June, 794 pounds; in July, 4,248 pounds; in August, 3,183 pounds; average weight of cheese, 33 pounds; price received for those sold at factory, at wholesale, 16 cents, at retail, 18 cents per pound. A sad accident inaugurated the commencement of this factory, which caused the death of Mr. Eben Hall, one of the directors, who was killed by the cheese press falling upon him. The cheese from this factory took the premium at the Lincoln County Agricultural Fair at Wiscasset, in 1873.

PHILLIPS AND AVON CHEESE MANUFACTURING COMPANY.

Organized May, 1873. D. Howard, President; A. L. Bradbury, Secretary; N. B. Beal, Treasurer. Building, 28 by 50 feet, erected in May, 1873. The factory commenced operations June 17th, and closed October 1st, having made about twelve tons of cheese. The factory is furnished with Ralph's Oneida Vat, and Frasher's Gang Press. The factory received the milk of 150 cows during the season, which number the directors think will be doubled another year. Cheese sold for 15 cents per pound,—their average weight being 50 pounds. The cost of making was two and one-half cents per pound; ten pounds of milk was required for a pound of cured cheese. The company is a joint stock association, in shares of $50. Joel Wilbur, chairman of the Board of Directors, is Superintendent of the factory.

CENTRE MONTVILLE CHEESE MANUFACTURING COMPANY.

Organized in June, 1873, by the choice of the following officers: J. B. Thompson, President; C. Murray, Treasurer; Volney Thompson, Collector; E. H. Carter, Alonzo Bryant, J. L. Caine, R. F. Jackson, Directors. Factory 28 by 58 feet, two stories high, and provided with a Miller & Son's vat. Opened July 4th, and closed September 4th. Shares in the company, $25 each. Superintendent of factory, J. Q. Murray, from New York. As full returns from this factory have not been received, it is impossible to give other particulars that would be of interest.

EAST SANGERVILLE CHEESE FACTORY ASSOCIATION.

Incorporated March 30th, 1873. Directors, Daniel Spooner, F. D. Dearth, William Jackson; Treasurer, Benjamin Lane; Secretary, John Hill, Jr. Shares in the company, $20 each. The building,—which is 32 by 60 feet, three stories high, and provided with a Miller & Son's vat of 565 gallons,—was put up in June, and the factory commenced operations the 23d of that month, closing on the 30th of August. Number of pounds of milk received, 119,225; number of pounds of cheese made, 11,742. Most of this cheese has been sold in villages near the factory, at from 15 to 16 cents per pound. The cheese was fifty days old when weighed,—the average weight of each cheese being 39 pounds. The vat used in this factory was made at the factory from patterns and material furnished by Miller & Son, Utica, New York, and cost very much less than it would to have purchased it there. The entire cost of the building was $1,000; of the apparatus and fixtures, $700. The milk of about 100 cows has been furnished the factory; the cost of making the cheese being two and one-fourth cents per pound. Asa S. Spooner, Superintendent of factory.

SOUTH PARIS DAIRYING ASSOCIATION.

Organized March 10th, 1873. Board of officers: William Swett, President; G. A. Wilson, Secretary; A. Shurtlief, Treasurer; Q. C. Perry, William O. King, J. K. Hammond, Directors. Factory built in May,—a two story building 28 by 45 feet, provided with a Ralph copper-lined vat. Operations were commenced June 16th, and closed September 16th; during which time, 275,825 pounds of milk were received, and 27,000 pounds of

cheese made; 155 cows furnished milk to the factory. The average weight of cheese was 45 pounds each, most of which has been marketed near the factory, at 15 cents per pound. Shares of the company, $50 each. The Trustees have had the superintendance of the factory, and in their report, say: "It having been the first year of our operations, and not having had any experience in the business, nor sufficient milk to run the factory profitably, the cost of making our cheese has been more per pound than it would have been, had circumstances been in our favor." The quality of the cheese made has been excellent.

Wilton Cheese Company.

This association was organized March 15th, 1873, with the following officers: Directors, Otis Hathaway, Enoch M. Bridges, James Averill, William W. Wilkins, N. H. Swift; Superintendent of Factory, E. M. Bridges. Factory put up May, 1873; operations having been commenced July 1st, and suspended August 31st. Size of factory, 26 by 40 feet, two stories high; number of cows, 60; cost of making cheese, 2½ cents per pound; average weight of cheese, 33 pounds. Marketed in Augusta, Gardiner, Lewiston and other places near the factory, at 15 cents per pound. Price of shares in the company, $40. The blank returned from this company does not give the total amount of milk received, or cheese manufactured.

Union Cheese Manufacturing Company.

Organized June 17th, 1873, by choice of the following officers: Jason Hills, President; J. B. Hurd, Treasurer; D. A. Wadlin, Secretary; Jason Hills, D. A. Wadlin, Amos Pitcher, T. B. Coleman, E. B. Foster, R. W. Ellis, P. G. Hunt, Directors. The factory, 28 by 32 feet, was put in operation May 13th, and closed August 31st, 1873, during which time the milk of six cows was received. Total number of pounds of milk received, 116,974; number of pounds of cheese made, 12,000. Market in Belfast, at 15 cents per pounds; cost of making, 3 cents per pound. Price of individual shares in the company, $50. Merritt R. Moody, Superintendent of factory.

From the factories at West Minot, Rumford, Northport and Phillips, no returns have been received.

The year has been one of only average returns to the farmer,—indeed, in some particulars, the crops are below the average. The yield of hay,—one of the great staples of Maine, and a crop of great importance to our farming and our climate,—has been a heavy one, and was harvested in good condition. The season throughout the growing period of the grain and other crops, or from June to September, was very dry,—less than ten inches of rain falling for the whole time; and this severe drouth seriously affected all crops, causing a light yield of grain of all kinds, materially reducing the potato crop, and with an early frost in August, greatly injuring the crop of corn in many localities. The yield of apples has also been very light. But as the failure of the hay crop is more severely felt by the farmer than that of any other farm products,—no hay, no cattle; no cattle, no manure; no manure, no crops,—it is to be hoped the almost complete failure of the other crops grown in our State, may not burden the farmer, or cripple his efforts at progress and advancement.

Our agricultural societies are in a prosperous condition, and are perhaps accomplishing as much towards the advancement of our farming interests, as at any period of their history. A matter of some concern is, however, beginning to manifest itself in their transactions, viz: the decisions of committees, and the awards of premiums. It is becoming a matter of some difficulty to obtain men who will give an unbiased opinion, and so many are the ways practiced by interested exhibitors to obtain the premiums offered, that the decisions of committees in some important classes at both our State fairs and county exhibitions, are subjects of considerable dissatisfaction. It is something that should receive the careful study of managers of these societies, and it is hoped that by calling attention to it, some plan may be devised whereby the evils resulting from it may be avoided in the future.

The "State College of Agriculture and the Mechanic Arts," has graduated its second class, and seems fairly entered on the high road to success. Having overcome many difficulties, and outgrown some defects, nothing now seems to stand in the way of its prosperity, unless it may be the want of a sufficient fund to provide the necessary force of professors and instructors. Already, in consequence of the increased number of students, it has

been found expedient to divide the labors in some of the departments, by obtaining assistants; and in order to retain competent men as instructors, the Institution must pay as high salaries as those in other states can offer. Should the fund of the General Government become too limited for this purpose, as it must if the College continues to furnish the instruction demanded of it, it may be a question whether the State would not act wisely in rendering suplementary aid for this purpose. There are now one hundred and three students at the College, with a Freshman class of thirty-four. At the graduation exercises this year, a deeper interest was manifested in the proceedings than was noticeable last year; with a programme marked for distinctiveness and individuality, and a lesser following of the old scholastic institutions. A new barn,—a building much needed, and in every respect a credit to the Institution,—has been erected this year, and it is hoped better stock of the different breeds, for purposes of practical study and comparison, will soon be found upon the farm.

At the annual session of the Board in 1872, a vote was passed to the effect that one-half the portion of the State Bounty to Agricultural Societies, over which the Board exercises authority, instead of being offered for the encouragement of wheat culture, as it had been for the three years previous, be offered for general farm improvements of a permanent character, in whatever direction the managers of the several societies deemed would best carry out the objects of the recommendation,—it being understood that the plan would reach over a period of three years in order to accomplish the best results. The improvements in the different counties,—inaugurated under this vote,—embrace the renovation of grass lands, the planting of orchards, the improvement of pastures, the building of fences and farm buildings, the reclaiming of waste lands, and other objects which tend in a marked degree to give permanent improvement to our farms and the agriculture of the State. So far, the plan has worked well, and at the end of 1874, should the same advisory vote be continued by the Board another year, which is certainly desirable to give full force to the object in view; the reports of the several societies upon this matter will be looked for with much interest, as it is hoped they will embody experiments and results of great value to the agriculture of our State, and to farmers generally.

The other half of the State aid, placed under the advisory disposition of the Board, was continued for the formation and

encouragement of Farmers' Clubs; the expression of the Board being very unanimous in favor of thus continuing this portion of the State Bounty. These clubs have accomplished, and are still accomplishing, great good among the farming community; and it seems to me, their formation in districts and localities where they do not now exist, should be fostered and aided to the fullest extent possible. They are capable of working high improvements in our system of farming, by means of their experiments, and by stimulating thought and discussion, and also of elevating and rendering more independent the position of farmers, by the co-operation they offer and extend to one another. By means of their meetings for practical discussions, the social element is cultivated, at the same time the mind is awakened; while by their public exhibitions, and the results of the several experiments they may carry out, a positive addition is made to agricultural knowledge. In Massachusetts, the State recognizes these organizations as valuable auxiliaries in the cause of farming improvements, by providing in its general statutes that "Farmers' Clubs properly organized and holding regular meetings, shall, upon application made annually in November, to the Secretary of the State Board of Agriculture, receive copies of the report of the Board and its other publications, in proportion to the number of its members; clubs receiving such benefits, to annually make returns to the Secretary of the Board, of the agricultural experiments made by them, and of the reports of their committees." Would not some such recognition by the State of our Farmers' Clubs, tend to their greater permanency, and therefore to their enlarged usefulness?

The public statutes of the State, which contain a large number of laws in which farmers are specially interested, are not generally accessible to this class of citizens. Farmers should be well informed in regard to the laws regulating agricultural societies, highways, cattle, weights and measures, forest trees, and similar matters of direct concern to them; but as a general thing their knowledge upon these points is very deficient. It seems to me, a good purpose would be served, by codifying these laws, and publishing them in a body for the benefit of farmers. This has been done in the case of school and insurance laws, and I deem this object, as certainly not secondary to those in importance, and one which would accomplish good results.

The year has been noticeable for the thorough establishment in our State of the plan of associated dairying by the factory sys-

tem; and returns from eighteen factories that have been in operation during the season, will be found in previous pages. Four other companies have also been in operation, from which no reports have been received; one company is already organized and has a factory built which it will put in operation early another year, and several other companies are also now being organized for going into operation in the spring. In connection with the reports from these associations, will also be found some account of the first introduction of the system into Maine, and a few practical suggestions upon the subject.

The present year has also witnessed the holding of the first exhibition of the Maine State Pomological Society, an association incorporated February 17, 1873. Our State possesses superior advantages as a fruit growing section, and this interest needed the formation of such a society, to carry forward the work of progress in fruit culture. At the present time, the tendency of thought and labor is to specialties: special effort in a certain direction, accomplishes, by the aid of skilled labor, the best results; and hence are needed societies for the advancement of these special interests, as aids in carrying out their purposes. This society is officered by efficient, capable gentlemen, devoted to the objects it has in view, and its first exhibition was a most successful one. Its transactions appear in full, in the second part of this volume.

The Maine Poultry Association, was also incorporated January 25, 1873; and in another line of effort, is designed to accomplish similar results to the above. Such societies are all working for the promotion of a common cause, and are deserving the encouragement of every one interested in the advancement of our agricultural and economical industries.

The meetings of the Board have been well attended, interesting, and it is to be hoped, productive of good. The winter session was held in one of the oldest towns in the State, at the very place where improved farming had its birth, where the first agricultural society in the State was organized, and where the first farmers' newspaper was originally printed. The autumn session was held in the county of Aroostook; our grand Maine county, which, laid down upon the State of Massachusetts would cover it all over, —the county of vast dimensions; of almost limitless resources in the best kinds of lumber; of unsurpassed advantages for grain growing and stock raising, and rich in useful minerals. During

the past fifteen years,—at which time a brief report on its physical characteristics and agricultural capabilities, was published in the report of the Board,—Aroostook county has been largely settled up, its advantages as a farming section have become more generally and widely known; and the meeting of the Board of Agriculture within its borders, during the present year, will also have much influence in making known in a far greater degree, its advantages and capabilities as a rich agricultural district. That the section of Maine now embraced in this county is to become the grain field of New England, cannot for a moment be doubted by those who are familiar with its resources, and who have clear views of the future industry, population and business of our country.

As the year is closing, a great financial break-up is precipitated upon the country; which, while bringing ruin and distress to many, will without doubt be productive of solid good in the end,—for it is well we should come down to the substance of things occasionally, and realize from whence our wealth as a people, our strength as a nation, are derived.

We have all heard much of late in agricultural discussions and in agricultural writings, about the unprofitableness of farming, that it *don't pay*, and that farmers as a class get smaller returns for their labor than men in any other occupation whatever. And agricultural writers and talkers who ought to know better, have thoughtlessly, perhaps, done much harm by this kind of talk. They have made a good many farmers dissatisfied, and sent away many young men of only ordinary talent to the city, when in fact, all their efforts should have been directed towards uniting farmers together, and making them better contented with their business and their profits,—for farmers have profits, where farming is well conducted. But amid the ruins of banks, the bursting of fancy bonds, the stopping of heavy wheels that have given employment to thousands of operatives, and the general crash in nearly all branches of manufacturing industry; the farmer does not stop to ask if farming pays. The farmer himself, as well as the business man who takes sound views upon great questions of this kind, unite in regarding the position of the independent farmer, as one least affected by financial disturbances, of any occupation or business whatever. With the closing year, let these lessons be taken home by every farmer in our State,—and studying them, let

all endeavor to gather satisfaction and happiness from the calamity which is being so severely felt by other classes,—that it does not come nigh them; and may all hereafter have a greater love for, and a deeper devotion to that business, which is the basis of all wealth and prosperity.

Two papers intended for this report are necessarily omitted; one on the Cattle and Cattle Husbandry of the State, for which, material has been collecting during the past two years, deferred on account of additional information which is wanting, not being yet in hand, and also on account of the engravings to accompany it not being ready,—and one on Human Foods; the latter of which, will probably be completed in season for the second part of this volume.

SAMUEL L. BOARDMAN,

Secretary Maine Board of Agriculture.

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