PAPERS

ON

AGRICULTURE;

CONSISTING OF

COMMUNICATIONS

MADE TO THE

Massachusetts Society for Promoting Agriculture,

WITH

EXTRACTS FROM VARIOUS PUBLICATIONS.

BY THE TRUSTEES OF THE SOCIETY.

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1804.

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PREFACE.

THE Truſtees of the Maſſachuſetts Society for promoting Agriculture offer the public their collection of papers for 1804, being the 7th number of their publications. The pamphlet conſiſts of a few original communications, believed intereſting and ſeaſonable, and of ſelections from foreign works adapted to the uſe of cultivation in this country. It will be remembered that the object and duty of the board is to convey to practical farmers through the preſs, the agricultural information which they receive or learn from others. Whilſt on this account, they are not reſponſible [illegible]

[illegible] they have laid before the public, including the preſent pamphlet, will be found to contain, not only ſome highly intereſting articles of natural hiſtory, but valuable hints and facts reſpecting ſeveral of the leading parts of huſbandry. Though in many inſtances the methods of cultivation in uſe may be the beſt which, conſidering the capital of the farmer, the comparative value of labour and land, and other circumſtances, can be adopted, yet in other inſtances much room exiſts for improvement. It cannot be doubted that information conveyed in printed works may be ſubſervient to the correction of errors in opinion and practice, and to the diffuſion of good modes of culture.

Thoſe who take the trouble to prepare this publication are aware, that in this ſubject theory is good for

for nothing till ſanctioned and confirmed by experience; that old modes of huſbandry ought to be held in reſpect and changed with caution and moderation,* and that *farming by books* merely, is juſtly derided. At the ſame time they are convinced that Agriculture derives aid from the diſcoveries and labours of the philoſopher, the naturaliſt and the chemiſt; that principles grow out of practice; and that inquiry is the road to improvement. They have no more reſpect for a bigoted attachment to injudicious cuſtoms, than for a raſh ſpirit of innovation; nor can they aſcribe wiſdom or modeſty to thoſe, who think their own practice compriſes all that is or can be known, and refuſe to read printed documents, which relate the obſervations and experiments of others.

The different reſults of the experiments on *potatoes*, as related in the two firſt papers of this collection, will naturally excite attention, and probably put thoſe, who are not ſatisfied about planting large or ſmall potatoes, eyes, or cuttings, upon further trials of the different methods.

The obſervations on the *progreſs of vegetation* in the next paper, compriſe a part of natural hiſtory, which is evidently applicable to the uſe of agriculture. A ſufficient number of notices of this kind would afford the beſt ſort of almanac for regulating ſeed time. It is hoped gentlemen in various parts of the country will frame and fill up ſimilar tables. Where the ſeveral trees, ſhrubs and plants, here mentioned are wanting, they may be ſupplied by other kinds. The field or the wood will compenſate the deficiency of the garden.

We publiſh a new confirmation and illuſtration of Mr. Cooper's doctrine and practice, reſpecting *ſeeds*,

* "Nor thou the rules, our fathers taught, deſpiſe,
Sires by long practice and tradition wiſe."
SOTHEBY'S TRANS. GEORGICS, B. i. v. 115, 116.

ſeeds, as related in a letter of his in a former number, and it is to be wiſhed that every farmer will endeavour to teſt and be able to verify them for himſelf.

The ſketch of *ſoils and manures* muſt be uſeful to all who would have the habit of diſcriminating the ſeveral ſpecies of each, and adapting culture accordingly; and the analyſis of *lime* and *marl* requires ſo much knowledge of chemiſtry only as can be learned and applied by the common farmer. The treatiſe on the culture and preparation of *hemp* being intended for the inhabitants of Canada, is of courſe applicable to our inſtruction.

The efficacy of *ſalt in curing clover* is propoſed to the ſerious attention, and the careful experiments of farmers. The documents here publiſhed will ſhow how much reaſon there is to expect it will be found highly beneficial; and the *premium* offered by the truſtees, is added to other inducements, for giving it further trials.

The files of the Society contain a number of ſets of anſwers to Agricultural Queſtions ſent out by the truſtees ſome years ago. They delay making uſe of what they have in hopes of more. Will farmers, into whoſe hands they are put, favour them with their anſwers, that they may proceed to give the public the information received either entire or digeſted? For this and other aſſiſtance in fulfilling their office, the truſtees look not only to intelligent individuals, but to the agricultural aſſociations in different parts of the ſtate, to ſome, or moſt of which they are already indebted; and to one for the firſt document in this pamphlet.

In the name of the Society, the truſtees repeat their requeſt to theſe aſſociations for original communications, and their aſſurances of ability and readineſs to publiſh for their and the general benefit whatever novel, intereſting or ſeaſonable matter, they ſhall put at their diſpoſal.

PREMIUMS

PREMIUMS

Offered by the TRUSTEES *of the* MASSACHUSETTS SOCIETY *for promoting* AGRICULTURE.

1ſt. TO the perſon who ſhall diſcover an effectual and cheap method of deſtroying the Canker-worm, and give evidence thereof, to the ſatisfaction of the truſtees, on or before the 1ſt day of October, 1805, a premium of *one hundred dollars*, or the Society's gold medal.

2*d*. And a premium of *one hundred dollars*, or the Society's gold medal, to the perſon who ſhall, on or before the 1ſt day of December, 1805, diſcover an effectual, and the cheapeſt method of deſtroying the Slug-worm, and give evidence thereof to the ſatisfaction of the Truſtees.

3*d*. An annual premium of *thirty dollars* for each year, previous to 1805, to the perſon who ſhall introduce into the ſtate of Maſſachuſetts a ram or ewe for the purpoſe of propagating a breed of ſheep ſuperior to any in the ſtate at the time they are ſo introduced. If from a foreign country *fifty dollars*. Claims to be preſented on or before the 1ſt of October, annually.

4*th*. To the perſon who ſhall produce the largeſt quantity of wool, meat and tallow, from the ſmalleſt number of ſheep, not leſs than one ſcore raiſed on his own farm, a premium of *thirty dollars*; to be claimed on or before the 1ſt day of Auguſt, 1805.

5*th*. To the perſon who ſhall, in one year, by a method new and uſeful, or that ſhall be an improvement on the methods already practiſed, make the greateſt quantity of compoſt manure in proportion to the expenſe; to be of a good quality, and compoſed of materials common to moſt farms; the quantity to be at leaſt two hundred tons; and the claims to be accompanied with a deſcription of the yard or place, and the mode in which the ſame is made; a premium of *fifty dollars*, or the Society's gold medal. And for the next greateſt quantity, being not leſs than one hundred tons, *thirty dollars*. Claims to be preſented previous to the 1ſt of Auguſt, 1805.

6*th*. To the perſon who ſhall ſhew by actual experiment, on not leſs than two acres, to the ſatisfaction of the Truſtees, a new or improved, being the beſt and cheapeſt method, of introducing fine graſs, fit for hay or paſture, into low freſh meadows, now producing coarſe wild graſs, or buſhes, a premium of *thirty dollars*. Claims to be preſented before the 1ſt of November, 1804.

7*th*. To the perſon who ſhall diſcover any ſpecies of graſs, not commonly cultivated or known, of a quality for the food of neat cattle or horſes, equal or ſuperior to thoſe now in uſe, *fifty dollars*. Claims to be preſented on or before the 1ſt of October, 1804.

8*th*. To

8th. To the perſon who ſhall preſent to this Society the moſt complete (being nearly complete) Hortus Siccus, exhibiting diſtinct ſpecimens of the greateſt variety of graſſes in general uſe, and ſpecify, to the ſatisfaction of the Truſtees, their reſpective qualities, productiveneſs and uſefulneſs as food for different kinds of animals, the Gold Medal, and *fifty dollars;* to be claimed on or before the 1ſt of October, 1805.

9th. To the perſon who ſhall produce, from ſeed, the beſt growth of thrifty trees, not leſs than 600 in the whole, and in the proportion of 2400 to the acre, of any of the following kinds of foreſt trees, *viz.* oak, aſh, elm, ſugar maple, beech, black or yellow birch, cheſnut, walnut or hiccory, *twenty-five dollars;* if all of oak, *fifty dollars.* Claims to be made on or before the 1ſt of October, 1806.

10th. To the perſon who ſhall aſcertain by accurate analyſis, the conſtituent parts of ſeveral fertile ſoils reſpectively, and in like manner the parts of ſeveral poor ſoils, and thus ſhall diſcover the defects of the latter; and ſhall ſhow, by actual experiments, how the ſaid defects may be remedied by the addition of earths or other ingredients, which abound in the country, and in a manner that may be practiſed by common farmers, *fifty dollars.* And if it ſhall appear, to the ſatisfaction of the Truſtees, that, upon an extenſive practice, the improvement of the poor ſoil would be more than equivalent to the expenſe of the improvement, the addition of *one hundred dollars.* A minute deſcription of the ſeveral ſoils, and all the circumſtances attending the proceſſes, cultivation and reſults, will be required. Claims to be made on or before November, 1804.

11th. To the perſon who ſhall, by actual experiment on a quantity not leſs than half a ton, ſhew the beſt method of curing clover hay with ſalt; regard to be had to the quality of the hay and the ſaving of labour, and the ſhortneſs of time between cutting and packing it in the mow, the ſilver medal or *thirty dollars*; and to the perſon who ſhall ſhew the next beſt method, *twenty dollars.* Samples of the hay to be exhibited 3 months after it is cured to a majority of the ſelectmen or to the ſettled miniſter and juſtice of the peace in the vicinity. Claims to be made on or before the laſt Friday of November, 1804.

12th. It is required that the communications, for which the foregoing premiums are offered, be accompanied with proper certificates from the Selectmen, Magiſtrates or Clergymen of the vicinity, or other vouchers, to the ſatisfaction of the Truſtees; that they be delivered in without names, or any intimation to whom they belong; that they be ſeverally marked in ſuch a manner as each claimant ſhall think fit; the claimant ſending alſo a paper, ſealed up, having on the outſide a correſponding mark, and on the inſide his name and addreſs.

By Order of the Truſtees,
JOHN AVERY, Secretary.

AGRICULTURE.

ORIGINAL PAPERS.

CULTURE OF POTATOES.

Communication to the Brookfield Agricultural Society, ſent for publication to the Truſtees.

IN cultivating potatoes, the manure which my experience has led me to the choice of, is the dung thrown from the ſtalls of neat cattle. The hay or ſtraw, which commonly becomes mixed with it, I believe to be not at all injurious. This manure is much preferable to horſe-dung, which, for ſeveral years, (following the practice of my father,) I made choice of for potatoes, until I became convinced, that it was not ſo ſuitable for this purpoſe, as the former, on account of its breeding worms in the hill, much to the injury of the potatoes.

When the Spaniſh potatoe was introduced among us, which was between thirty-five and forty years ago, it was the invariable practice, for a number of years, in preparing the ſeed for planting, to cut the potatoes in ſmall pieces, with one eye each piece. This practice anſwered very well with that ſpecies of potatoes, while it was almoſt the only one cultivated. But as different kinds were introduced, thro' inattention they became intermixed, and by planting them in this mixed ſtate, I ſoon diſcovered a ſenſible depreciation of every ſpecies. Suſpecting the cauſe, I became more careful in ſelecting my ſeed. My only object, however, was to ſeparate the different ſpecies without paying any regard to ſize. I further adopted the practice of planting my potatoes whole; having been convinc-

ed there was nothing gained by cutting them, unleſs it was ſome of the largeſt; and my practice was to plant the large and ſmall promiſcuouſly. The conſequence was a great inequality in the ſize of the potatoes and the growth of the tops. In ſearching for the cauſe of ſuch unequal vegetation, in the ſame ſeaſon and in the ſame ſoil, equally manured, after thirty years experience and obſervation in digging potatoes, I have, for ſome years paſt, been convinced, from the ſkeleton of the ſeed potatoe, which, at the time of harveſting, often remains in perfect ſhape and ſize, that large potatoes produce a much more luxuriant growth, both above and beneath the earth, than ſmall ones; for when I come to a hill of ſtocky luxuriant tops, I have learned to anticipate a plentiful yield of large potatoes, in which expectation I am ſeldom diſappointed. And hence I was of opinion, that by ſelecting ſuch for ſeed, the crop would be more equal in ſize and ſuperior in value.

Having been for ſome years eſtabliſhed in this belief, my faith was a little ſtaggered upon reading the communication of JOSEPH BARRELL, Eſq. to the Maſſachuſetts Agricultural Society, on this ſubject. I therefore determined the laſt ſpring, to ſatisfy myſelf reſpecting the beſt method of procedure, ſo far as a ſingle experiment, upon a ſmall ſcale, might anſwer the purpoſe. Mr. BARRELL, from his experiments, is convinced, that ſmall potatoes are as good for ſeed as large; that three in a hill are better than a larger number; that cut potatoes are better than whole; and that the eyes are beſt of all. The reſult of my experiment was the reverſe.

On one ſide of my field, where the ſoil appeared perfectly uniform and which was equally manured, I made my experiment in the following manner: I began by planting three rows (leaving however the outſide row) with eyes, carefully taken from large handſome potatoes, putting ſeven in a hill. I next planted three rows with potatoes of the ſame ſize, cut in ſmall pieces, with

with an eye in each piece, putting five pieces in every hill. I next planted three rows adjoining, with three ſmall potatoes (of the ſize of a walnut with the ſhell) in a hill. Next to theſe I planted three rows with two large potatoes in each hill. I then drove a ſtake into the ground at each diviſion, and cut a letter in each, to prevent miſtake. The eyes I believe all ſprouted and came up ; but the tops through the ſeaſon were ſlender and dwarfiſh. Between the cuts and ſmall potatoes there was no viſible difference ; they were, however, conſiderably more luxuriant than the rows planted with eyes. The branches of the large potatoes overtopped the others to a great degree. The ſeaſon, from the middle of Auguſt, was uncommonly dry, which conſiderably injured the crop. About the laſt of September, the appearance of the tops indicating that they had come to their full growth, I dug them carefully with my own hands, leaving none of the bigneſs of an ounce ball. I dug of each twenty-ſeven hills, carried them to a green ſpot, counted and meaſured them carefully, but did not aſcertain their weight. The reſult was as follows :

From 27 hills planted

with eyes,	381 potatoes,	meaſuring	$2\frac{6}{8}$	pecks ;
with cuts,	465 do.	do.	$4\frac{1}{2}$	do.
with ſamll,	539 do.	do.	$4\frac{6}{8}$	do.
with large,	530 do.	do.	7	do.

It is worthy of notice, that the potatoes raiſed from the eyes, cuts and ſmall, were of all ſizes ; a few only of them were as large as any in the field, and many of them were ſo ſmall as to be ſcarcely worth picking up, while the produce of the large ones were of an equal and handſome ſize. It is alſo deſerving notice, that the other parts of the field, which was all planted with large potatoes, uniformly yielded a crop ſimilar to the three rows planted in the ſame manner.

I am, gentlemen, &c.

BENJ. ADAMS.

Brookfield, Jan. 31, 1084.

To

To the Rev. Doct. PARKER, *Corresponding Secretary of the Massachusetts Society for Promoting Agriculture.*

SIR,

YOU may remember I sent the Agricultural Society the result of an experiment I made the last year, on planting *twelve eyes of one single potatoe*, which was 232 potatoes from the eyes, and 22 *very small*, from the core without skin or eye cut into 6 pieces.—*I then noted that those from the core were all of the Irish apple kind*, THE SAME AS THE POTATOE PLANTED, and *those from the eyes were all of another kind, much like the English whites.*

On the 30th of April last, I planted on *high dry land*, with the common manuring of the farmer, and as the potatoe fields are generally planted, *a part of the produce* which was raised from the single potatoe last year, viz: Of the 232, I cut from 185 potatoes 1596 eyes, which weighed just 8 pounds; these I planted in 5 rows and 3 quarters of a row, 240 feet long; *they did not sprout for a long time, as the season was very dry*, and I began to be discouraged, until the rains came, and brought up all that would sprout, and the shoots, in general, were very feeble; I counted the sprouts, and found only 1015 shoots, *consequently* 581 *eyes never vegetated at all;* some of these I dug up, *and found them as dry as parchment, and nearly as thin;* from which I conclude I cut the eyes too thin. Deducting the proportion of weight of the 581 eyes which did not vegetate, it left the weight of those that did, only about 5 pounds; these 5 pounds, therefore, produced (including the produce of the 22 small ones mentioned below) 17 bushels and 1 peck of very fine sizeable potatoes which weighed 81 pounds per bushel, consequently 1397pounds. The 22 small ones were planted whole in the remaining quarter of the sixth row; these, in general, were not biger than large cranberries, the produce of the core of last year, *and all of them of the Irish apple*

apple kind. 18 of these, only, vegetated, and the produce 165 potatoes, great and small; SOME OF THE IRISH APPLE KIND, AND SOME LIKE THE ENGLISH WHITES.—*The cores of the* 185 *potatoes I cut into* 465 *pieces, and planted in the 7th row;* of these only 112 *sprouted; these came up long before the eyes, and appeared flourishing the whole season, and produced* 2470 *potatoes which measured* 4 *bushels and three pecks. Note, the produce of these cores were not small* (as from the core of the first potatoe,) *but all sizeable, some very large,* AND ALL OF THEM WERE LIKE THE ENGLISH WHITES, AND NOT ONE LIKE THE ORIGINAL IRISH APPLE.

Upon the whole, from this experiment, I find

	Pounds.
The actual produce gathered was 22 bushels. wt. 81 lb. per bushel is	1782
Note, If the 581 eyes had vegetated and produced in the same proportion the 1015 did, the weight would have been	800
And if the 47 potatoes, (which were used,) the remainder of the first years crop, had been planted, and produced in the same proportion, it would be	654
	3236

equal to 40 bushels from one potatoe the *second year, and that a very dry season, and the Irish apple potatoe (upon which the experiment was made) is a very indifferent bearer in all seasons.*

The piece of land, on which I made the experiment, was 240 feet by 24. I planted seven rows the whole length, (and might have made an eighth,) this piece contains 640 square yards, which is about two fifteenths of an acre.

If, therefore, 640 square yards did produce 22 bushels you will find 4840 square yards (the contents of an acre) will produce 166 bushels, and in this proportion was actually the produce *this dry season,* and if the season had been favourable, and the 581 eyes which did not

not vegetate, had produced ONLY *in this ſame proportion, it would make* 240 *buſhels to the acre*, and this from 60 pounds weight of eyes, or about three pecks meaſured, which is three hundred and twenty-four fold.

If, therefore, any farmer is ſo blinded by prejudice as to continue planting from 10 to 15 buſhels upon an acre, which will weigh from EIGHT TO TWELVE HUNDRD POUNDS OF SEED, and is content to harveſt from SIXTY TO ONE HUNDRED BUSHELS AS THE PRODUCE, inſtead of planting SIXTY POUNDS OF EYES, *that will meaſure about* THREE PECKS OF SEED, from which he will harveſt *two hundred buſhels and upwards*, on ſuch, experiment and advice is thrown away! I ſhould adviſe to cut the eyes about half as thick again as the back of a common caſe-knife which I ſuppoſe would vegetate in a dry ſeaſon.

Note, The potatoes, after the eyes are cut out, are, for every purpoſe of feeding cattle, as good as before, *and the large ones are good for family uſe.*

I wiſh ſome gentleman could ſatisfactorily anſwer the following queſtions:

How came the produce of the core of the firſt potatoe (which was Iriſh apple) to be all of the Iriſh apple kind *and very ſmall*, and the produce of the *eyes* of the ſame potatoe to be *all* of another ſort, and good, ſizeable, and ſome very large? How came the ſmall ones, which were the produce of the core the laſt year, and *all of the apple kind*, to produce this year, both the apple kind and thoſe like the Engliſh whites? How came the produce of both the eyes and the core of thoſe planted this year, to be all like the Engliſh whites, ſuch as were planted, and thoſe from the cores *not ſmall* as laſt year, but *as large*, in proportion, as thoſe from the eyes.

I would juſt mention, that the potatoes produced from the Iriſh apple, which are like the Engliſh whites, *are very much better than the Iriſh apple.*

I am Sir,

your moſt humble ſervant,

JOSEPH BARRELL.

Obſervations of the Progreſs of Vegetation, made at Cambridge, *from* 1793 *to* 1796, *incluſive ; by* JAMES WINTHROP, *Eſq.* F. A. A. *and* F. H. S. *and of the Agricultural Society.*

TABLE I. Time of Bloſſoming.

Plant.	1793	1794	1795	1796
Aſparagus,	15 May	15 May	6 June	
Apple,	29 April	29 April	10 May	4 May
Apricot,	16 April			
Currant,	20 April	23 April	5 May	24 April
Cherry,	17 April	23 April	6 May	27 April
Elm,	27 March	7 April	4 April	8 April
Gooſeberry,	12 April	23 April	1 May	23 April
Grape,	16 June	22 June	25 June	24 June
Honeyſuckle,	15 May	15 May	27 May	21 May
Lilac,	7 May	4 May	15 May	13 May
Lime,	27 June		29 June	28 June
Lily,	19 June		29 June	28 June
Nectarine,	15 April			29 April
Horſe Cheſnut,		15 May	16 May	
Peach,	20 April	23 April	27 April	23 April
Pear,		29 April	10 May	
Plum,	16 April	19 April	7 May	30 April
Quince,	11 May	11 May	25 May	18 May
Tulip,		5 May	10 May	12 May
Raſpberry,	22 May		1 June	1 June
Pink,			1 July	24 June
Willow,	16 April	19 April	27 April	22 April
Black Poplar,		17 April		21 April
Syringa,	22 May	27 May	4 June	30 May
Dama. Roſe,	7 June		14 June	15 June
White Roſe,	23 May	20 May	10 June	1 June
Oak,	11 April	18 April	24 April	22 April
Birch,	29 April			18 April
Maple,		18 April		17 May
Button,		27 April	7 May	
Aſh,			24 April	
Snowball,			15 May	15 May

By the bloſſoming of the Button, is intended only the opening of the bud, ſo as to diſcover the ball ; for the tree, in reality, does not diſcover its bloſſom to an obſerver.

Table

Table II. Of firſt open Leaves.

Plant.	1793	1794	1795	1796
Apple,	9 April	18 April	24 April	22 April
Apricot,		28 April	7 May	23 April
Currant,	25 March	24 March	24 April	10 April
Cherry,		19 April		27 April
Elm,	6 May	1 May	8 May	6 May
Gooſeberry,	25 March	3 April	17 April	10 April
Grape,	9 May	3 May	10 May	29 April
Honeyſuckle,	28 Feb.	23 March		8 April
Lilac,	28 Feb.	January	17 April	10 April
Lomb. Poplar,	29 April	21 April	7 May	29 April
Peach,		21 April		27 April
Plum,	13 April	19 April	2 May	23 April
Blk. Poplar,	12 April	19 April	7 May	23 April
Quince,	11 April	19 April		1 May
Roſe,	beg. April	January	April	March
Raſpberry,	25 March	24 March		8 April
Strawberry,	beg. March	January	April	March
Syringa,	7 April	3 April	17 April	16 April
Willow,	4 April	18 April	17 April	16 April
Pink,	beg. April	January		March
Lily,	11 April	January	1 April	March
Snowball,	6 April	21 April	25 April	23 April
Oilnut,	20April	22 April		3 May
Oak,		1 May	11 May	
Mulberry,		5 May		
Wh. Mulberry,	12 April	21 April	10 May	4 May
Aſparagus,	24 April	25 April		23 April
Lime,	1 May	2 May	9 May	5 May
Button,	6 May	1 May	7 May	1 May
Horſe Cheſnut,		21 April	27 April	1 May
Tulip,		1 April	April	1 April
Althea,				22 May

Several of theſe plants put out their leaves ſo early as to looſe them again by freezing. Such plants ſeem rather to be nouriſhed than injured by hoar froſt, and unleſs the freezing be very ſevere and followed by ſudden heat, their leaves do not appear to ſuffer materially from the freezing degree of cold. They will for a little while bear a degree of cold ſeveral degrees below freezing.

Table

TABLE III. Containing ſeveral ripe fruits and eſculent plants, according to the firſt ſpecimens in each year, as I met with them in my own garden or elſewhere.

Fruit, &c.	1793	1794	1795	1796
Aſparagus,	15 April	20 April	26 April	24 April
Strawberries,	27 May	27 May	11 June	3 June
Peaſe,	28 May			12 June
Cherries,	29 May		June	
String-beans,	15 June			27 June
Raſpberry,	26 June		3 July	
Turnips,	20 June			
Apricots,	1 Aug.	24 July		
Nectarines,				6 Sept.
Peaches,	15 Aug.	20 Aug.		6 Sept.
Plums,	Aug.	Aug.	29 Aug.	3 Sept.
Melons,	Aug.	15 Aug.	20 Aug.	27 Aug.
Grapes,	30 Aug.	28 Aug.	12 Sept.	17 Aug.
Gooſeberries,		16 July	July	July
Currants, red,		25 June	29 June	26 June
white,		25 June	25 June	28 June
black,		16 July	Aug.	

If theſe minutes had been originally made with a view to publication, I would have taken care to fill the blanks. They are, however, more numerous, and placed in a more compact form, than any others that I have ſeen, and I hope they will be the means of ſtimulating ſome of our aſſociates to bring forward their obſervations, that by a compariſon we may endeavor to bring this branch of knowledge to perfection.

The preceding obſervations chiefly relate to thoſe plants which have a perennial root. They may be of uſe to determine when the ground is warm enough to receive the ſeeds of annual plants. With reſpect to theſe, it is of importance that we ſhould know at the time of planting, when we may reaſonably expect them to be in eating. Unleſs we are careful to multiply and vary our experiments, and to publiſh all of

 them

them that come to our knowledge, we can never hope for a regular ſucceſſion of freſh vegetables, which is the perfection of a garden. It is to contribute toward ſo deſirable an end, that the following experiments are communicated, and I hope, by the united endeavors of our ſociety, with other inſtitutions of the ſame kind, that we ſhall have agriculture as much a ſubject of calculation as aſtronomy is at preſent.

TABLE of the growth of Indian Corn, and the number of days from planting for each period of growth.

Planted.	*Sprouted.*	*Taſſelled.*	*Silked.*	*Eatab. green.*	*Seaſon.*
1792 May 4	12 May 8	30 June 57	14 July 71	1 Aug. 89	*very dry*
1793 April 23	6 May 13	26 June 64	10 July 78		
26	8 May 12	19 June 54	5 July 70	23 July 88	
27	8 May 11	21 June 55	5 July 69		
July 15	22 July 7	24 Aug. 40	15 Sept. 61	10 Oct. 86	*exceſſive dry*
1794 May 3	15 May 12	27 June 55	12 July 70	29 July 87	*not very dry*
June 21	28 June 7	28 July 37	13 Aug. 53	1 Sept. 72	
1796 April 27	15 May 18	10 July 74	24 July 88		

The principal circumſtance which cauſed any difference of growth, appears to be the time of planting. What was planted about the beginning of May, appears to have required from 86 to 89 days to be fit for eating. What was planted earlier, took longer time to come forward, and did not ripen at ſo early a date as that at the beginning of May. That planted in July loſt in the fall the time it gained in ſummer, and furniſhed green corn for the beginning of October. The ſpecimen planted about the middle of June, kept its growth the whole ſummer, and became fit for eating in 72 days. Not much appears to depend on the character of the ſeaſon.

Summary

Summary of obſervations made on the leaſing and flowering of trees, near Boſton, *and on the firſt ſpecimens of ripe fruit and eſculent vegetables from* 1797 *to* 1803, *incluſive, by* JAMES WINTHROP.

Tree or Plant.	*Firſt Leaves.*	*Firſt open Flowers.*
Almond,		13 April
Althea,	22 May to 5 June	
Apple,	28 April to 5 May	28 April to 15 May
Apricot,	23 to 29 April	20 April to 4 May
Aſparagus,		
Aſh,		26 April
Birch,		19 April
Button,		7 May
Cherry,	19 April to 4 May	25 to 29 April
Currant,	31 March to 3 April	28 April to 14 May
Elm,	4 to 11 May	31 March to 18 April
Fig,	23 May	
Filbert,	2 to 4 May	
Gooſeberry,	31 March to 3 April	27 April to 7 May
Grape,	3 to 22 May	20 June to 2 July
Honeyſuckle,	21 March to 8 April	21 May to 8 June
Horſe Cheſnut,	1 to 10 May	14 to 24 May
Larch,	1 May	
Lilac,	2 to 4 April	10 to 16 May
Lime,	3 to 8 May	21 to 30 June
Lily,	31 March to 5 April	28 June to 6 July
Locuſt,		12 June
Maple,		20 April to 2 May
Mulberry blk.	5 May	30 May
Mulberry wh.	4 to 18 May	26 June
Nectarine,	30 April	20 April to 14 May
Oak,	10 to 15 May	16 to 23 May
Oilnut,	3 to 8 May	June
Paſſion Flower,		7 July
Peach,	10 to 30 April	20 April to 13 May
Pear,		4 May
Pink,	March	29 June to 8 July
Plum,	1 to 8 May	25 April to 14 May
Poplar,	2 to 10 May	20 to 24 April
Quince,	1 to 15 May	21 to 31 May
Raſpberry,	3 to 8 April	28 May to 2 June
Roſe, damaſk,	12 April to 1 May	9 to 18 June

Tree

Tree or Plant.	*First Leaves.*	*First open Flowers.*
Senna,	15 May	21 June
Snowball,	25 April to 4 May	15 May to 1 June
Strawberry,	March	27 April to 17 May
Syringa,	3 to 19 April	28 May to 8 June
Tulip,	27 March	14 to 21 May
Walnut,	3 to 16 May	
Willow,	4 to 16 April	23 April to 8 May

First specimens of Fruits and Esculent Vegetables, from 1797 to 1803 inclusive.

Asparagus,	21 to 30 April	Melons,	15 to 27 Aug.
Almonds,	18 Sept.	Nectarines,	6 Sept. to
Apples,	August	Peaches,	15 Aug. to 6 Sept.
Apricots,	12 to 13 Aug.	Pears,	
Cherries,	29 May to	Plums,	26 Aug. to 3 Sept.
Currants,	25 to 29 June	Raspberry,	4 to 9 July
Figs,		Strawberry,	27 May to 3 June
Filberds,		String Beans,	15 June to 3 July
Gooseberries,	16 July	Pease,	28 May to 12 June
Grapes,	22 Aug. to 12 Sept.		

Cambridge, 22d *Feb.* 1804.

MY DEAR SIR,

I wish the foregoing list of observations was more extensive and complete. They were made merely that I might obtain a general knowledge of our climate and its variations. As I know of no others that have been made, I send them to the society, in hopes that it may incite others to do better, and to complete what is now merely begun.

I am, Sir,

Your very humble servant,

JAMES WINTHROP.

Dr. DEXTER.

ON SOILS AND MANURES.

FROM THE "NEW FARMER'S CALENDAR," 4th EDIT. LOND. 1802.

BY the ſoil, is generally underſtood, the upper ſtratum, or covering, of the earth, which is the object of cultivation; the next layer, or bed of earth, is termed the ſub-ſoil. The component parts of ſoil or mould, of whatever colour, proper for vegetation, are Argill, Sand, Water, and Air; for unto theſe original principles may all earths be reduced, however blended, or joined with apparently foreign ſubſtances. Argill is the ſoft and unctuous part of clay. The primitive earths, argill and ſand, contain each, in perhaps nearly equal degrees, the *pabulum*, or food of plants; but in their union, the purpoſes of vegetation are moſt completely anſwered.

The preciſe quantities of each, neceſſary in this union, or whether they ought to be equal, is neither eaſy nor very material to aſcertain, in a general or theoretical way; ſince that point is beſt determined in practice, when the ſoil proves to be neither too ſtiff and adheſive, from the ſuperabundance of clay; nor of too looſe and weak a texture, from the over large quantity of ſand in its compoſition. The happy medium in general it is, which conſtitutes the richeſt ſoils; but an exceſs towards adheſion, or ſtiffneſs, is obviouſly moſt ſafe.

Theſe moulds will retain the rain ſufficiently to abſorb all its fructifying virtues; but not ſo long that it becomes ſtagnant, chilling, and unwholeſome. They are known to experienced people, by the ſight and touch; and although they adhere to the feet in paſſing, they may be rubbed off without any great difficulty.—The ſub-ſoil, whether it be retentive or porous, ſpringy or dry and warm; and the ſituation of the land, whether of level or irregular

ular ſurface, together with the expoſure, form very material points in the eſtimate of its fertility.

The mixed or ſecondary earths are, Clay, which is compounded of argill and ſand; Loam, or a mixture of ſand and clay; Gravel, or ſand and ſtone; Till, or iron earth; Silicious and Calcarious, ſandy, ſtony, or flinty earth, chalk, and lime; Marl, which is compoſed of ſtone, argill, and ſand, and is uſually denominated after that ingredient, which may chance to predominate; thus the ſoapy or unctuous kind is called argillacious; the ſtony, calcarious; and the ſandy, ſilicious marl.

The various ſoils, compounded of the above earths, will rank under ſome of the following common denominations: Clays, Sands, Loams, Gravels, Chalks, Clayey Loams, Gravelly Loams, Sandy Loams, Chalky Loams, Peat and Bog, Moor and Heath. The ſoil of bog generally inclines to clay, that of heath, to ſand. Theſe terms are ſubject to an accommodating variation, and we frequently hear of a loamy gravel, as well as a gravelly loam; in the firſt, the gravel is ſuppoſed to be the baſe, and to predominate: and ſo of other variations.

Manuring, or amending the ſoil, is performed by mixing with it certain ſubſtances, known by experience to contain a portion of that matter, which is the food of plants, or to poſſeſs the property of looſening and decompoſing the earths, and exciting into action their dormant virtues; by ſimply increaſing the depth of its ſtaple, with the addition of mould; by altering and correcting its quality, with that ſpecies of earth in which it may be deficient, as in giving friability to clay by the aſſiſtance of ſand, and tenacity or ſtiffneſs to ſand by the admixture of clay; by draining off ſtagnant water, above or below; by irrigation, or flooding with ſimple water, or by warping, which is, to flood the land with thick river-water, for the ſake of

of a conſiderable ſettlement of mud; by paring and burning the ſurface; by fallowing.

Vegetable, as well as animal bodies, are furniſhed by nature with abſorbent veſſels, through which they attract, or ſuck up, from the ſurrounding earth and air, that matter deſtined for their nouriſhment: the fibres of their roots do the moſt material part of this office of nutrition.

The *pabulum*, or food of plants, conſiſts, I think, obviouſly, of elaſtic and non-elaſtic fluids; of ſteam or vapour, and of water, which are drawn in various forms, from both earth and air. It is not poſſible, that any groſs, or terrene ſubſtance, could pervade the minute and almoſt imperceptible organs of plants. Their food is the eſſence merely, or, ſo to ſpeak, the *eſſential ſubſtance* of the bed of earth in which they are poſited, in the form of *gas*, or ſteam; hence, probably, a given quantity of mould, after having thrown out a large vegetable weight, ſhall have loſt ſcarcely any of its own, as hath often been experienced. By way of illuſtration, this eſſence may be compared with the ſpirituous part of alcohol, which bears no compariſon in weight with the mere liquid maſs. The hypotheſis naturally extends to thoſe manures, we ſelect to repleniſh the earth, when exhauſted of its vegetable nouriſhment. It is the eſſence of thoſe ſubſtances, which goes to ſupply the defect of the ſoil; and experience, as old as the ſuppoſed date of the world, has proved that ſuch as abound moſt in oils, mucilages and alkaline ſalts, are the moſt powerful fertilizers of land. Perhaps any ſubſtance, ſuſceptible of putrefaction or diſſolution, and which contains nothing noxious to the vegetable creation, is convertible to the food of plants.

The above deſultory ideas ought, by no means, to be conſtrued into any intended diſreſpect to the authority of the celebrated Haſſenfraz: The labours

of

of ſuch eminent profeſſional men ought to be accepted by the world with gratitude, and their opinions received with all but implicit deference. I am aware that the theory of the carbonic ſubſtance, or the coaly reſiduum of ſubſtances, as the food of vegetables, is now generally received by our chemical agriculturaliſts. But I beg leave to aſk, are we ſure there is any novelty in this diſcovery, or does the novelty conſiſt, as in certain other diſcoveries, purely in the nomenclature? Virgil, Cato, and Columella, I believe, were equally well aware with us moderns, that vegetation would be promoted by the charcoal of almoſt any ſubſtance; that the putrefactive heat, as well as actual combuſtion, might be likely to produce a coaly ſubſtance; and that ſuch ſubſtance muſt neceſſarily be ſoluble, before it could become the food of plants.—If it be pretended, that carbon is excluſively the food of plants, I conceive ſuch a notion is contradicted by every day's experience, which demonſtrates to our ſenſes, that vegetables are nouriſhed by the eſſence or vapour of freſh dung, as well as by that which is arrived at its carbonacious ſtate.

It is in courſe to give a catalogue of the various animal and other ſubſtances, which are proper for manure, and it has at leaſt one particular uſe, that of reminding the cultivator of ſome articles within his reach, which might elſe have eſcaped his notice; but reſpecting the particular application of theſe, dependent as it is upon ſuch numerous contingencies, which may entirely alter the ſtate of the caſe, every one muſt be left to his own experience and diſcretion. None other than general rules, founded on evident and permanent principles, can, with propriety, be given; as the numerous agricultural inſtructions, perfectly ludicrous from their direct oppoſition, ſufficiently evince.

The

The principal manures will be found in the following lift: the excrements of all animals, including bones, hair, blood, and offals; feathers; the auxiliary earths, chalk, lime, rubbifh, &c. beforementioned; putrefied vegetables, bark, wood, and leaves; foot; afhes; malt and rope-duft; fawduft; falt; woollen rags; fcrapings of oiled leather; fea-water and weeds; fifh-blubber; oil; river and pond mud and weeds; fullage or fweepings of ftreets and roads; growing vegetables, turned in by the plough, or green manures.

The principle feems to have obtained general affent, and with good reafon, that animal manures are the moft powerful, and that the excrements of fat, particularly corn-fed animals, are far fuperior to thofe which are lean and ftore-fed.

The perfection of the culture of lands confifts in returning to it, through the medium of manures, the whole of that effential fubftance, extracted by the crops; in the total eradication of weeds, and in the difperfion of ftagnant water.

Prefuppofing induftry and capital, nothing can be more eafy, than to keep a farm, as well as a garden, in conftant heart; for the bountiful earth allows us the advantage at ftarting, not requiring any returns, until it has prefented us with various crops. As to the pretended impoffibility of entirely extirpating weeds, fetting afide the example of other countries, China particularly, in the hufbandry of which not a reed is to be feen, every one, poffeffed of induftry and refolution, may be convinced it is a mere pretence. *We have only to kill them by all the various and well-known methods, as faft as they come, and there muft neceffarily be an end to their coming.* I freely acknowledge this to be an expenfive procefs in the beginning; but I fully defy any man to difprove that it is true economy in the end.

Manure, amply ſufficient to recruit the exhauſtion of cropping, ought to be produced by the animals kept upon the farm, with the aſſiſtance of the ſtraw; beſides which, nothing, even to the moſt minute trifle, ſhould be neglected, which may, in any way, contribute to enrich the compoſt dung-hill. Thus every farmer, if he ſhall ſo chooſe, may be abſolutely independent in this reſpect, in full and ſafe reliance on his own home reſources.

ON CHANGE OF SEED.

From the "New Farmer's Calendar," page 375—381.

IN treating of the Courſe of Crops, I have acceded to the general idea, that nature affects variety; although, when viewed through the medium of her own ſpontaneous efforts, ſhe gives the moſt ſtriking proofs of a contrary tendency; and, perhaps, our conviction, or our deception, ariſes from a deficient ſtatement of the caſe.

The three famous propoſitions of Tull, on the change of crops, appear to me unanſwerable, upon any philoſophical, or fairly experimental ground. "1. *That plants, of the moſt different nature, feed on the ſame ſort of food.* 2. *That there is no plant, but what muſt rob any other plant within its reach.* 3. *That a ſoil, which is proper to one ſort of vegetable once, is, in reſpect to the ſort of food it gives, proper to it always.*" Theſe propoſitions militate not againſt the truth, that various plants affect various ſoils; but the vegetable *pabulum*, or food, is the ſame thing in all.

On change of ſeed, or of individuals, of the ſame ſpecies, we are generally guided by analogy, with the

the prevailing notion on the change of ſpecies; granting it a deluſion, it is ſurely a very harmleſs one; but, in certain caſes, it may be of ſome little conſequence to a farmer, to be convinced, that no harm can happen, nor any defect of produce ariſe, from re-ſowing the ſeed on the ſame ground whence it was produced. The earth, of herſelf, produces and re-produces moſt luxuriantly, from the ſame ſeed, for centuries, or forever, without wearineſs, or deſire of change.

The idea of a neceſſity for occaſionally croſſing the breeds of animals has prevailed in a ſimilar degree, and does ſtill prevail, notwithſtanding the moſt ſatisfactory proofs of the futility of ſuch maxims, derived from the invariable ſucceſs of breeding in-and-in.

If a man poſſeſſes ſeed, perfect in its kind, and the ſpecies equally adapted to the ſoil, he may, perhaps, get harm, but ſurely ought to expect little good, from a change. There can ariſe no poſſible benefit from croſſing with inferior ſtocks; but changes ought to be indefatigably purſued, until the beſt be obtained; then remain the grand objects, either of further improvement, or the prevention of degeneracy; and theſe will ever ſlip through the hands of men, unpoſſeſſed of the virtue or the habit of perſevering induſtry. No pains, no expenſe, no diſtance, are ever too great, to obtain the beſt ſtock, dead or alive, or the beſt implements.

To ſow imperfect ſeed, is a practice nearly allied to madneſs, or folly; a folly, of which our wives are never guilty, who ever take eſpecial care to put new, at leaſt ſound eggs, under their hens; and ſeeds are the eggs of vegetables. More cannot be had from a thing than it poſſeſſes; and if we ſow bad ſeed, or ſeed deficient in the true ſeminal qualities, we ought to expect a crop defective, either in quality, quantity, or both.

Green

Green and ſhrivelled corn, ſuch as has not ſtood long enough to arrive at maturity, ſhould never be ſown; much of it, as I have experienced, will not vegetate at all; of that which ſucceeds, the ſample, at leaſt great part of it, will be lean and ſteely, moſt clearly demonſtrating its hereditary defect.

I would certainly not ſow black, or ſmutty wheat, by choice; but, of two evils, I think I ſhould prefer heavy black wheat, for ſeed, to the unripe, lean, and ſhrivelled. Smutty wheat often happens to be the plumpeſt and moſt weighty of the crop, and its flour as full of the vegetable gluten, which ariſes from the blight having taken place ſubſequent to the perfect formation of the kernel, whence, from its maturity and power of reſiſtance, the infection may be no more than ſkin-deep. The celebrated axiom, in breeding-cattle, that "*like produces like*," ſo ſucceſsfully proved in practice, may, no doubt, be equally depended upon in the vegetable creation; and it is ſound and rational advice in Marſhall, to ſelect ſeed from the moſt forward and vigorous plants, of every ſpecies: yet it is an old opinion, that the ſmalleſt grained wheat, if plump and perfect, is as likely as any to produce a luxuriant plant, and fine ſtock; whence an advantage in ſowing ſuch, with reſpect to the meaſure, as the object is the number of kernels.

The greateſt attention ſhould be paid to the cleaning ſeed-corn, which ought to be perfectly free, not only from the ſeed of weeds, but from every weak and apparently unfruitful kernel, ſince theſe laſt, granting they vegetate, may only help to encumber and exhauſt the ſoil with unhealthy and uſeleſs plants. I never think the expenſe thrown away, of having ſeed-wheat picked over carefully by the hand.

The opinions and practice of Mr. Joseph Cooper, a reflecting and philoſophical American cultivator, appear

appear to be perfectly decisive on this interesting subject. Mr. Cooper, disregarding the ancient prejudice of a necessity for the change of seeds and roots, and the procurement of them from distant and different soils, on the contrary, has, for many years, been in the habit of selecting the best seeds and roots of his own; and although he has continually sown and planted them on the same soil, every article of his produce is greatly superior to those of any other person who supplies the market, and they seem to be still in a state of improvement. This, without his knowing it, is the very same plan that was adopted by Mr. Bakewell, in England, with respect to animals.

Mr. Cooper was led to his present practice, which he began more than forty years ago, by observing that vegetables of all kinds were very subject to change, with respect to their time of coming to maturity, and other properties, but that the best seeds never failed to produce the best plants. Among a great number of experiments, he particularly mentions the following: About the year 1746, his father procured seeds of the long watery squash; and though they have been used in the farm ever since that time, without any change, they are, at this time, better than they were at first.—His early pease were procured from London in 1756, and though they have been planted in the same place every season, they have been so far from degenerating, that they are preferable to what they were then.—The seeds of his asparagus he had from New-York in 1752, and though they have been treated in the same manner, the plants have been greatly improved.—Mr. Cooper has experienced precisely the same result with potatoes, and attributes the failures of other people to their planting the refuse, instead of the largest and best shaped.—Mr. Cooper is also careful to sow the plants, from which he raises

raiſes his ſeed, at a conſiderable diſtance from any others. Thus, when his radiſhes are fit for uſe, he takes ten or twelve which he moſt approves, and plants them at leaſt one hundred yards from others that bloſſom at the ſame time. In the ſame manner he treats all other plants, varying circumſtances according to their nature.

In 1772, a friend ſent him a few grains of a ſmall kind of Indian corn, not larger than gooſe-ſhot, which produced from eight to ten ears on a ſtock. They were alſo ſmall, and he found that few of them ripened before the froſt. Some of the largeſt and earlieſt of theſe he ſaved, and planting them between rows of a larger and earlier kind, the produce of them was much improved. He then planted from thoſe that had produced the greateſt number of the largeſt ears, and that were the firſt ripe; and the next ſeaſon, the produce, with reſpect to quality and quantity, was preferable to any that he had ever planted before. From this corn he has continued to plant ever ſince, ſelecting his ſeed in the following manner. When the firſt ears are ripe enough for ſeed, he gathers a ſufficient quantity for early corn, or for replanting; and at the ſame time that he wiſhes his corn to be generally ripe, he gathers a ſufficient quantity for the next year's planting, having particular care to take it from *ſtalks that are large at the bottom, of a regular taper, not very tall, of good ſizeable ears, and of the beſt quality;* theſe he dries quickly, and from thence he plants his main crop; and if any hills be miſſing, he replants from the ſeeds that were firſt gathered, which he ſays will cauſe the crops to ripen more regularly than they commonly do, and which is of great advantage. The common method of ſaving ſeed-corn, by taking the ears from the heap, is attended, he ſays, with two diſadvantages; one is, the taking the largeſt ears, of which, in general, only

only one grows on a ſtalk, which leſſens the produce ; and the other is, taking ears that ripen at different times.

For many years, he renewed all the ſeed of his winter grain from a ſingle plant, which he had obſerved to be more productive, and of better quality than the reſt, which he is ſatisfied has been of great uſe. He takes particular care that different kinds of the ſame vegetables do not bloom at the ſame time near together, by which they injure each other. On every kind of ſoil, Mr. Cooper prefers planting the rows of Indian corn ſix feet aſunder each way, as nearly at right angles as may be, and leaving not more than four ſtalks on a hill.

It is alleged, that foreign flax-ſeed produces the beſt flax in Ireland; but Mr. Cooper ſays, that when it is conſidered that only the bark of the plant is uſed, and that this is in perfection before the ſeed is ripe, it will appear that his hypotheſis is not affected by it.—Mr. Cooper has the following inſtance of the naturalization of a plant in a different climate. He had ſome water-melon ſeed ſent him from Georgia, which, he was informed, was of a peculiarly good quality ; knowing that ſeeds from vegetables that grow in a hot climate, require a longer ſummer than thoſe in Pennſylvania, he gave them the moſt favourable ſituation he had, and uſed glaſſes to forward their growth, and yet few of them ripened well ; but ſaving the ſeeds of thoſe that ripened firſt, and continuing the practice five or ſix years, they came to ripen as early as any he ever had.

The above method of managing exotic ſeeds has been lately found ſucceſsful in France.

ON

ON THE ANALYSIS OF LIME AND MARL.

FROM THE "COMMERCIAL AND AGRICULTURAL MAGAZINE," PAGE 3, VOL. VII.

LIME.

IN order to judge of the goodneſs of Lime, the lime-ſtone loſes much of its weight in calcination, and the lime-ſhells are extremely light: if the ſhells require a large proportion of water to ſlake them fully; if it is long before they begin to fall; if the lime-ſtone is not apt to run or be vitrified in the operation of burning; if it falls entirely when it gets a ſufficient quantity of water after it has been properly calcined; if it ſwell very much in ſlaking; and if the lime is light, fine to the touch, and of a pure white, the farmer may be ſatisfied that it is extremely good, and may uſe it in preference to any other lime, that is inferior to it in any of theſe reſpects. Theſe rules are ſufficient as to the comparative value of any two kinds of lime that may be oppoſed to one another, and may be relied upon as ſufficiently accurate for the ordinary purpoſes of the farmer. But that ſuch as may diſcover a new quarry of lime-ſtone, and who wiſh to aſcertain with certainty its real value, before they put themſelves to any expenſe about it, will do well to employ the following more accurate, and, in that caſe, more eaſy analyſis.—As all calcarious matters are capable of being diſſolved in acids, and as no earthy matter can be diſſolved in them, it follows, that if a ſufficient quantity of acid is poured upon any body, that contains calcarious matter, this matter will be quickly diſſolved, while the others are left behind; and the proportions of each may be accurately aſcertained.

To try the exact value of any kind of lime-ſtone, or other calcarious matter, take a quantity of aqua-fortis

fortis or nitrous acid, or ſpirit of ſalt, or muriatic acid. It may be obſerved, that all the mineral acids effervefce, and unite with calcareous earths. But as the ſulphuric or vitriolic acid (ſpirit or oil of vitriol) does not diſſolve the calcareous matter, but forms a new concrete that ſtill retains its ſolid ſtate, it is not fit for this experiment. And as it ſometimes happens that a little vitriolic acid is mixed with either the nitrous or muriatic acids, it is neceſſary to be certain that this is not the caſe before they are employed in this experiment. The eaſieſt way of trying if theſe acids are free from the vitriolic, is to put a little chalk into them before employing them. If the acid is pure, the chalk will diſſolve very readily; but if not, ſome part of the chalk will fall to the bottom, in the form of a pure white ſediment. When this is the caſe, add ſmall bits of chalk, by little and little, till no more of that white ſediment appears; after which the acid may be kept for uſe as ſufficiently pure. If the nitrous acid is ſo ſtrong as to have a ſlight brown or reddiſh appearance, it ought to be diluted with water till it aſſumes a greeniſh look. As it is bought in the ſhops for the uſe of the diers, &c. it is uſually weak enough.—If the muriatic acid is ſo ſtrong as to have a bright yellow colour, or emits fumes when the bottle is opened, it ought to be diluted, by adding water till it aſſumes almoſt a colourleſs tranſparency, with a very faint tinge of yellow. When they are thus prepared, (either of theſe acids may be uſed indiſcriminately for this experiment, as they are equally proper) put them into a glaſs, or earthen veſſel; add to that, by little and little, a known quantity of the matter you mean to examine, which had been previouſly dried and reduced to powder. After each addition, ſuffer the violent effervefcence or ebullition that will enſue to abate before more is added. When

the whole of the powder is put to the acid, and the effervefcence entirely fubfided, ftir it about fevera times with a piece of tobacco-pipe, and allow it to remain for fome time, that the acid may act upon every particle of the matter, and thoroughly diffolve it: and to be certain that there has not been too little acid, put a few drops of frefh acid to the folution, which will excite a frefh effervefcence, if the whole is not fully diffolved. When no change is produced by this addition, it is a certain proof that the whole of the calcareous matter is already diffolved. Take then a piece of filtering paper, thoroughly dry, the weight of which is alfo to be known, fold it properly, and put it into a glafs funnel; pour the whole of the folution, with the matter that may have fubfided, into the funnel, and allow it to filter through the paper flowly; when the fluid part has thus drained off, fill up the filter again with pure water, to wafh off the whole of the faline parts from the refiduum or matter that remains undiffolved.

Add water in this manner till it comes off without faline tafte; fuffer it then to drop off entirely, dry it thoroughly, weigh the paper with its contents; the difference between which, and what the powder and paper were at the beginning, is the whole weight of the calcareous matter, fo that its proportion to the whole mafs is perfectly afcertained.

MARL.

AS all Marls effervefce, or raife up frothy bubbles when acids are applied to them, and as water alone frequently produces the fame effects, when poured upon dry clay, it may be neceffary, in order to guard againft miftakes in making trials upon fubftances fufpected to be marl, to let them remain a little time in mixture with water, previous to their being fubjected to the teft of acids. The

beft

beſt or richeſt marls being ſuch as contain the largeſt proportion of calcareous earth; it frequently becomes a matter of importance to farmers, to be able to aſcertain the quantities, ſome being found ſo poor in this material, as to have only a twentieth or thirtieth of their weight, in order to decide on their advantage, in preference to lime, chalk, or other ſubſtances to be brought from a diſtance. A ſimple and eaſy method, founded on the knowledge that this earth contains about forty per centum of its weight of fixed air, or carbonic acid, is merely by ſaturating the marl with the nitrous or muriatic acid, and marking correctly the loſs of weight which it ſuſtains by extrication of the fixed air. Thus, if two hundred grains of marl be introduced into a veſſel, with a little water and muriatic acid poured upon them till the bubbles ceaſe to riſe, the loſs of weight being then found to amount to forty grains, the marl contains one hundred and ſixty grains of calcareous earth. The proportion of calcareous earth contained in different marl, may alſo be determined by diſſolving it, by means of the muriatic acid, diluting the liquor with water, paſſing it through a filtering paper, and then precipitating the calcareous earth from the clear liquid, by a ſolution of ſome fixed alkaline ſalt.

ON THE CULTURE AND PREPARATION OF HEMP IN CANADA.

Addreſſed to the Lords of His Majeſty's Committee of Council for Trade and foreign Plantations.

FROM THE COMMERCIAL AND AGRICULTURAL MAGAZINE, VOL. VI.

"MY LORDS,

"THE importance of this ſubject has been fully certified, in a letter preſented to your Lordſhips by my father, in January laſt, ſtating, among other

other obſervations, that upwards of thirty thouſand tons of hemp are annually imported into England, that I ſhall not enter into theſe particulars. I ſhall therefore now obſerve, that as it does not come properly within the views of the Society of Arts, &c. to furniſh inſtructions and give opinions upon general culture, but rather to publiſh the experiments of others, and leave deductions to be drawn from facts; yet, as the people of Canada have repeatedly applied to this country for information upon the mode of cultivating hemp to advantage, and having, as a member of the Society, attended various diſcuſſions upon the ſubject, I have been led to examine the whole culture and preparation of hemp in different countries, and am induced to lay before your Lordſhips ſuch information and ſhort inſtructions as I think will be conducive to eſtabliſh this great object in Canada; and have arranged the whole under diſtinct heads, as the operations follow in ſucceſſion."

On the Culture of the Hemp, and Choice of Seed.

THE ſoil for hemp ſhould be rich, deep, light, and moderately dry: of this deſcription, much can be found on the banks of creeks and rivers in Canada. If the ground has not had a previous ſummer fallow, it ſhould be ploughed once in the autumn, and twice in the ſpring; it ſhould then be harrowed extremely fine with iron-toothed harrows, and ſown with the hemp-ſeed, broad-caſt, after the rate of two buſhels of ſeed for an arpent, or four-fifths of a ſtatute acre; the ſeed ſhould then be harrowed in, by a harrow with ſmall iron teeth ſet cloſe.

Much care ſhould be taken in the choice of hemp-ſeed: that of the laſt year's growth ſhould be choſen, and ſuch as has not been heated in the carriage.

age. Choofe fuch feed as appears frefh, firm, and bright; prove it by rubbing it between your hands: if it fuffers this without breaking, and becomes brighter, it is a good fign; but if it be broken and made dufty by rubbing, it is unfit for the farmer's ufe.

Whatever feed is fent from England fhould be packed in fmall cafks, and great care taken to procure what is new and of the beft quality. Before it is depended on for a crop, a fmall quantity fhould be fown in good earth, in a warm, fecured fituation, to fee that it will vegetate. It has been fuppofed, that keeping the hemp-feed in a cellar, two or three weeks previous to its being fown, will affift its vegetation. The beft time for fowing hemp is between the firft and twentieth of May, according as the feafon is favourable: when it is fown, it fhould be carefully guarded againft birds till firmly rooted in the ground.

The hemp plants are of two kinds, viz. the male, which yields a farina, or powdery matter, and the female, which bears the feed. The action of the male farina upon the female plant is neceffary for the production of the feed, and its effects may be promoted by artificial agitation, at the time when the male plants are plucked from among the female, as hereafter mentioned.

The male hemp will be ready to pull, about the fecond week in Auguft: its ripenefs may be known from the farina or powder which it yields on agitation; alfo, from the leaves turning yellow, and the ftems a whitifh colour.—As it is of great confequence to raife, at prefent, as much feed as poffible in Canada, I would recommend the following plan to be now adopted for that purpofe, which may be deviated from at a fubfequent period, when feed is plentiful there.

When the male hemp is well ripened, let the per-

fons,

ſons, who pull the hemp, clear paſſages through the field, of about two feet wide, and ſix feet diſtance from each other, by pulling up the male and female hemp, which grow promiſcuouſly within the ſaid ſpace of two feet. Let the hemp thus plucked be carried to other ground in the neighbourhood, and ſpread thereon about an inch thick: after it has been thus laid for two or three days expoſed to the ſun and air, turn it with a ſmall pole, and let it lie a day or two more; then bind it up in bundles, about the thickneſs of your thigh, or near three quarters of a yard in circumference, and either proceed to water-rot it, as it is termed, immediately, as hereafter directed, or houſe it from rain, till a more convenient opportunity offers for the purpoſe. I have before obſerved, that beds of the hemp, of about ſix feet wide, ſhould be left growing, until an intermediate ſpace of two feet wide had been cleared, and the hemp which grew thereon carried away. You muſt then proceed to pull up the male hemp which was left growing among the female hemp, leaving the latter to grow with as little injury as poſſible until the ſeed is ripe. The male hemp may be dried in the intermediate ſpace of ground above-mentioned, and made up in bundles as the former.

Method of collecting Hemp-Seed.

The female hemp ſhould remain growing till the ſeed is fully ripe, the ſigns of which are the opening of the pods wherein the ſeeds are lodged, ſo much, that you may juſt perceive the ſeeds therein: they will have a brownifh appearance.

It may probably be the firſt or ſecond week in October before the female hemp ſhould be pulled; it ſhould then be carefully pulled to avoid ſhedding the ſeed, and be bound in ſmall bundles, and ſet to dry,

dry, with the root ends downwards, like corn in ſheaves. Avoid loſing the ſeed in pulling or drying, and when the bundles are dry, you ſhould have a wooden ſtool, with a ſheet or blanket under it, and, by ſtriking the hemp againſt the ſtool, to beat the ſeed from it into the ſheet or blanket, breaking your hemp as little as poſſible.

After you have ſeparated the ſeed from the hemp, either by beating it as above, or by thraſhing it ſubſequently, you muſt be careful of the ſeed, particularly whilſt it is new, to prevent its heating, which is beſt guarded againſt by frequently turning it; it ſhould then be kept in a dry place, but not too cloſe, for the air will aſſiſt in preſerving it.

I have been very particular in giving directions about preſerving the ſeed, in order that good ſeed may be procured in Canada, without the neceſſity of always ſending it from England, and to avoid the riſk of bad ſeed being ſent from hence. I ſhall now return to the relation of the method of preparing hemp, which had been previouſly plucked, and was ready for the water-ſteep, or water-rotting.

Water-ſteeping or water-rotting Hemp.

This operation is performed by placing the hemp, which had been previouſly made up in bundles about the thickneſs of a man's thigh, after drying it in the air, in a pond containing about five or ſix feet of water, and free from mud: the bundles of hemp ſhould be laid therein acroſs each other, and cloſe together, part of the heads one way, and part the other, the whole covered with water, and kept underneath it by ſtones, weights, or levers, till properly ſteeped, which may be known by taking out a bundle and waſhing it: if the leaves come off freely, the coat opens and eaſily ſeparates from the rind or ſtalk, it is enough; if not, it muſt lie long-

er,

er, under careful obſervation, till ready. When the hemp is found to be ſufficiently ſteeped, the bundles muſt be taken out, one by one, and waſhed to ſeparate the filth and looſe particles; it ſhould then be ſet on the root ends to drain, the bands be untied, and the hemp placed againſt a fence expoſed to the ſun and air, that it may be thoroughly dried. Where the convenience can be had of filling a pond with water and letting it off at pleaſure, ſuch a ſituation ſhould be preferred; but otherwiſe a common pond will anſwer.

In warm weather this operation of the water-ſteep may be performed in four or five days; in colder weather it will require eight or ten, and in very cold weather eighteen or twenty days may be neceſſary.

The intent of this proceſs is by a gentle fermentation to ſeparate the gummy and mucilaginous matter from the fibres of the hemp, with which they are intermixed, and to occaſion the bark or rind on the outſide of the fibres to be afterwards more eaſily detached by the brake.

Of the Management of Hemp by the Brake.

After the hemp has been watered and well dried, it is fit for the brake. If it cannot be ſufficiently dried in the open air, it may be done by drying it carefully upon ſticks placed acroſs, about four feet above a gentle fire; the hemp may be laid thereon about ſix inches deep, and carefully turned, from time to time, to be equally dried. In the hemp countries, wind and water mills, with particular machinery for the purpoſe, are contrived to break and prepare the hemp in a more cheap and expeditious manner; but in a country where a manufacture is in its infancy, the moſt plain and ſimple methods muſt be adopted, and ſuch machinery be uſed as the farmer can

can make himſelf. I have therefore added a drawing and deſcription of a hand-brake, and other neceſſary implements for preparing hemp, which will anſwer the purpoſe in Canada.

To brake the hemp, the perſon employed takes in the left hand a handful of hemp, and in the other the upper jaw of the brake; the hemp is laid acroſs, between the two jaws, and by raiſing and letting fall the upper jaw ſeveral times with great force, it brakes the dry ſtems under the rind that ſurrounds them. By this means, the gummy matter and pith are made to quit the hemp, and the operation is continued, till the whole handful be perfectly broken. The hemp is then ſtretched out on the ground or table, and when about two pound weight is thus prepared, it is made into a parcel, by doubling and twiſting it ſlightly, and is then called a head of hemp or undreſſed ſtuff. A woman may brake from twenty to thirty pounds of hemp in this manner, in one day.

On Scutching Hemp.

After your hemp has paſſed the brake, it muſt be ſcutched in the following manner:—Take as much hemp in your left hand as you can conveniently hold, and with your other hand, having broken the ſtraw of the hemp, lay it over the edge of the ſcutching-board with the roots foremoſt, and beat it downwards with the ſcutcher along the ſide of the board, turning and winding it with your left hand as you ſcutch it, till moſt of the ſtraw and dirt is beat out.

When that end is done, turn the other, and ſcutch it in a ſimilar manner; then lay that handful aſide and proceed with another, till the whole is finiſhed; then tie the hemp up in bunches, and

lay it in a place moderately dry, until you have occaſion to uſe it. The intent of this operation is to beat out and detach the rind and dirt previouſly looſened by the brake.

Method of Heckling Hemp.

When hemp is intended for coarſe yarn, it need only be heckled with a large toothed heckle; but if for finer uſes, it muſt be begun with a coarſe heckle, and afterwards paſſed through one or more fine heckles, as occaſion may require.

The buſineſs of the heckler conſiſts in ſeparating throughout the whole length, the fibres of the hemp, which the brake and ſcutcher have divided only in part. The common coarſe heckle is about 21 inches by 6 3–4, the teeth in the rows are about 1 3–4 inches aſunder, and extending 9 1–2 inches from the board in which they are fixed; they are placed in a quincunx order, ſo that the teeth of the ſecond row are in the centre of the ſpace of the firſt row. By drawing the hemp through the heckle, the teeth carry off a part of the gum contained amongſt the fibres of the hemp in the form of duſt, and by dividing the filaments, ſeparates entirely the heterogeneous matter contained among them. To effect this purpoſe, the heckle being fixed on a plank, one ſide of which inclines from the workman, he takes a handful of the hemp, which graſping in his right hand, he draws through the heckle, holding the other part of the hemp in his left hand to prevent its being entangled. After one end of the hemp is ſufficiently heckled it is reverſed, and the ſame operation performed on the other.

GENERAL OBSERVATIONS.

FROM accurate accounts lately received from Canada, it appears, that an acre of good land in corn

corn will not produce above half the value to the planter, that the ſame land will yield there in hemp; and that hemp may be grown ſucceſſively on the ſame land many years to advantage, when corn will not. An acre or two of land, it is agreed, may be planted with hemp on each farm there, without interfering with other buſineſs. The preſent account is calculated for thoſe perſons in Canada, who have not been previouſly accuſtomed to the culture of hemp, and who have not the advantage of large machinery to complete its preparation.

The whole of the buſineſs, even to the making of the implements here deſcribed, may be accompliſhed by the planter, and is ſufficient for the eſtabliſhment of this great national object, and of eventually preſerving to the Britiſh empire, the annual ſum of 1,500,000*£*. ſterling.

If your lordſhips will think proper, in the firſt inſtance to ſend ſome good hemp-ſeed to Canada to be ſold at moderate prices, but not given away; and if ſome perſons are appointed to purchaſe on fair terms the hemp prepared in Canada, and ſend it to England, a few years will eſtabliſh this trade on ſo firm a baſis, that no further protection from government will be neceſſary. If my obſervations on this ſubject meet your lordſhips' approbation, it is the only gratification I deſire. My wiſhes to promote the intereſt of this empire, and to fulfil your lordſhips' requeſt ſuggeſted to the Society of Arts in January laſt, have induced me to make the preſent attempt individually for that purpoſe.

I have the honour to be, with high reſpect, my lords, your very obedient ſervant,

No. 19, JOHN STREET,
ADELPHI, *June* 17th, 1802.

JOHN TAYLOR.

PREPARATION OF CHEESE IN ENGLAND.

FROM THE "COMMERCIAL AND AGRICULTURAL MAGAZINE," VOL. 5th.

CHEESE, a ſpecies of ſolid food, prepared from curdled milk cleared of the whey, and afterwards dried for uſe. As this article conſtitutes a material part of domeſtic conſumption, we find, in almoſt every country, one or more places celebrated for the ſuperior quality of their cheeſe. Hence we propoſe to enumerate the principal ſorts of this manufacture, both at home and abroad; introducing alſo an account of the mode in which they are prepared.

1. STILTON CHEESE is produced in the town of that name, in the county of Huntingdon; and, from its peculiar richneſs, and flavour, is ſometimes called Engliſh Parmeſan. The proceſs of making it is as follows: the night's cream is put to the morning's milk, with the rennet; when the curd is come, it is not broken, as is uſually done with other cheeſe, but taken out whole, and put into a ſieve, in order to drain gradually. While draining, it is preſſed, till it becomes firm and dry; when it is placed in a wooden hoop, or box, made to fit it, as it is ſo extremely rich, that, without this precaution, it would be apt to ſeparate. It is afterwards kept on dry boards and turned daily, with cloth binders round it, which are tightened as occaſion requires. After being taken out of the hoop, the cheeſe is cloſely bound with cloths, which are changed every day, till it acquires ſufficient firmneſs to ſupport itſelf; when theſe cloths are removed, each cheeſe is rubbed over daily, for two or three months, with a bruſh; and, if the weather be damp, or moiſt, twice a day: the tops and bottoms are treated in a ſimilar manner every day, even

even before the cloths are taken off. Stilton cheese is sometimes made in nets, resembling cabbage-nets; but these are neither so good, nor so richly flavoured, as those prepared in the manner before described. Although the Stilton farmers are in much repute for their cleanliness, they take but little pains with the rennet; as they, in general, cut small pieces from the *vell* or *maw*, that are put into the milk; and, being gently agitated with the hand, break, or turn it, so that the curd is easily obtained. We venture however, to say, that their valuable cheese might be improved, and few broken ones occur, if they would prepare the rennet in the manner adopted in the west of England; namely, by keeping the *vell*, *maw*, or *rennet-bag* (as it is differently called) perfectly sweet and fresh; for, if it be in the least degree tainted, the cheese will never acquire a fine flavour. When the *vell* or maw is fit for the purpose, a strong solution of salt should be made, with two quarts of soft, sweet water, into which are to be introduced sweet briar, rose leaves, and flowers, cinnamon, mace, cloves, and, in short, almost every kind of spice and aromatics that can be procured. The whole must boil gently, till the liquor is reduced to three pints, and care should be taken that it be not smoked. The spices should next be strained clean, and the liquor, when milk warm, poured upon the *vell* or maw. A lemon may then be sliced into it, and the whole stand at rest for a day or two; after which it should be again strained, and bottled. Thus, if well corked, it will keep good for twelve months, or longer, possess a fine aromatic odour, and impart an agreeable flavour to the cheese.

2. Cheshire Cheese is prepared in the following way: The evening's milk is not touched till the next morning, when the cream is taken off, and put to warm in a brass pan, heated with boiling water:

water: one third part of that milk is heated in a ſimilar manner. The cows being milked early in the morning, the new milk, and that of the preceding night, thus prepared, are poured into a large tub, together with the cream. A piece of rennet kept in luke-warm water, ſince the preceding evening, is put into the tub, in order to coagulate the milk; with which, if the cheeſe is intended to be coloured, a ſmall quantity of *arnotto* (or of an infuſion of marigolds, or carrots) is rubbed fine, and mixed; the whole is ſtirred together, and being covered up warm, allowed to ſtand about half an hour, or till it is coagulated; when it is firſt turned over with a bowl, to ſeparate the whey from the curd, which ſinks to the bottom, and is then collected into a part of the tub, provided with a ſlip, or looſe board, to croſs the diameter of the bottom, for the ſole purpoſe of effecting this ſeparation; on which a board is placed, wieghing from 60 to 120 pounds, in order to preſs out the whey. As ſoon as it acquires a greater degree of ſolidity, it is cut into ſlices, and turned over ſeveral times, to extract all the whey, and again preſſed with weights: Theſe operations may conſume about an hour and an half. It is then taken from the tub, and broken very ſmall by the hand, ſalted, and put into a cheeſe-vat, the depth of which is enlarged by a tin hoop fitted to the top. The ſide is then ſtrongly preſſed, both by hand, and with a board at the top, well weighed; and wooden ſkewers are placed round the cheeſe, at the centre, which are frequently drawn out. It is then ſhifted out of the vat, a cloth being previouſly put on the top of it, and reverſed on a cloth into another vat, or again into the ſame, if well ſcalded, before the cheeſe be returned to it. The top, or upper part, is next broken by the hand, down to the middle, ſalted, preſſed, weighed, and ſkewered, as before, till all the whey is extracted.

This,

This being done, the cheeſe is again reverſed into another vat, likewiſe warmed, with a cloth under it, and a tin hoop, or binder, put round the upper edge of the cheeſe, and within the ſides of the vat; the former being previouſly encloſed in a cloth, and its edges put within the veſſel. Theſe various operations are performed from about ſeven o'clock in the morning till one at noon. The preſſing of the cheeſe requires about eight hours more, as it muſt be twice turned in the vat, round which thin wire ſkewers are paſſed, and ſhifted occaſionally. The next morning it ought to be turned, and preſſed again, as likewiſe at night, and on the ſucceeding day, about the middle of which it is removed to the ſalting room, where the outſide is ſalted, and a cloth binder tied round it. After this proceſs, the cheeſe is turned twice daily, for ſix or ſeven days; then left two or three weeks to dry, during which time it is once turned, and cleaned every day; at length depoſited in the common cheeſe-room, on a boarded floor, covered with ſtraw, where it is turned daily, till it acquires ſufficient hardneſs. The room ſhould be of a moderate warmth, but no wind or draught of air, muſt be permitted to enter, as this generally cracks the cheeſe. The outſides or rinds of them, are ſometimes rubbed with butter, or oil, in order to give them a coat.

3. Gloucester Cheese is made of milk immediately from the cow; but which, in ſummer, is thought too hot, and is therefore lowered to the requiſite degree of heat, before the rennet is added, by pouring in ſkim-milk, or, if that will not anſwer, by the addition of water. As ſoon as the curd "*is come*," it is broken with a double cheeſe-knife, and alſo with the hand, in order to clear it from the whey, which is laded off. The curd being thus freed from the principal part of the whey,

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is put into vats, which are ſet in the preſs for ten or fifteen minutes, in order to extract all the remaining liquid.

It is then turned out of the vats into the cheeſe-tubs again; broken ſmall, and ſcalded with a pail full of water, lowered with whey, about three parts water to one of whey; and the whole is briſkly agitated, the curd and water being equally mixed together. After having ſtood a few minutes, to let the curd ſubſide, the liquor is poured off; and the former collected in a vat, the ſurface of which is, when about half full, ſprinkled with a little ſalt, that is worked in among the curd. The vat is then filled up, and the whole maſs turned two or three times in it, the edges being pared, and the middle rounded up at each turning. At length the curd is put into a cloth, and placed in the preſs, whence it is carried to the ſhelves, and turned, generally, once a day, till it has acquired a ſufficient degree of compactneſs, to enable it to undergo the operation of waſhing.

4. Wiltshire Cheese. The milk which produces this cheeſe is run, as it comes from the cow, or as it happens to be lowered, by a ſmall quantity of ſkim-milk mixed with it. The curd is firſt broken with the hand and diſh, care being taken, in firſt cruſhing the curd, to let the whey run off gradually, to prevent its carrying away with it the "*fat*" of the cowl. For thin cheeſe, the curd is not broken ſo fine as in Glouceſterſhire; for thick cheeſe it is cruſhed ſtill finer; and, for what is called *loaves*, it is in a manner reduced to atoms. The whey is poured off as it riſes, and the curd preſſed down. The maſs of curd is then *pared down*, three or four times over, in ſlices about an inch thick, in order to extract all the whey from it, preſſed and ſcalded in a manner ſimilar to the Glouceſter cheeſe. After ſeparating the whey, the

the curd is in ſome dairies, re-broken and ſalted in the bowl; while in others, it is taken out of the liquor and ſalted in the vat; thin cheeſes being placed, with a ſmall handful of ſalt, in one layer; thick ones, with two ſmall handsful, in two layers; loaves, with two handsful, in three or four layers; the ſalt being ſpread, and rubbed uniformly among the curd. Wiltſhire cheeſe is commonly ſalted twice in the preſs, where it remains, in proportion to its thickneſs; thin cheeſes, three or four, *meals*; thick ones, four or five; and *loaves*, five or ſix.

POTATOES FOOD FOR CATTLE.

FROM THE "FARMER'S CALENDAR. LONDON, 1802.

OF raw *potatoes*, a middling ox will eat a buſhel in twenty four hours, with which the common allowance of hay is ten pounds. A ſheep will eat a gallon in the ſame time, with a ſmall quantity of hay, ſaid by ſome to be ſo ſmall, that half a pound per day will ſuffice. A horſe will require, from half a peck to a peck per day, with hay. Potatoes have proved worth a ſhilling per buſhel, for fattening ſtock of all ſorts (ſwine excepted) on an average of years. The Gold-finder, Champion-potatoe, and Golden-globe, ſeem to have the preference. Mr. Mayo, of Suſſex, fatted yearly 6 oxen, 2 ſteers, and four cows, or heifers; killed one of 160 ſtone, that had 32 pound looſe fat within him. An ox, of 140 ſtone, ate rather more than a buſhel of potatoes per day, and 10 pounds of hay. Has had beaſts on turnips, that ate three buſhels per day, and as much as if they had no other food. With this feeder oxen fed as faſt on potatoes, as on oil-cake. I this day con-

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ſulted a Surrey farmer, one of the firſt in the neighbourhood of the metropolis, who applied raw potatoes to the purpoſe of fattening beaſts. He prefers them to any other food within his knowledge, when their price at market is not too high, the caſe at preſent. His practice is to put up middle ſized bullocks, in October, not quite half fat, which he makes ready for the butcher in three months, allowing, as I underſtand, as much hay as the beaſts will eat. Forty lambs ate greedily four or five buſhels cut potatoes per day in December and January, and they throve well upon them; when the potatoes ſcoured the lambs, a little hay amended that defect.—The Rev. Mr. Fuller, of Suſſex, takes up his ſheep, (South Downs) from the aftergraſs, middle of November, to a yard, with a ſhed adjoining, and there feeds them on potatoes with a little hay, morning and evening, until the end of February, or beginning of March, when they are fit for market. The roots are cut into two or three ſlices, and given in troughs under ſhelter. The lambs generally coſt 12 to 14 ſhillings, at two years old, fatted to nine or eleven ſtone, and ſold at 4 ſhillings per ſtone. The internal fat of one weighed 15 pounds. Mr. Fuller ſuppoſes potatoes equal in fattening ſheep, with corn, oil-cake, or graſs. When in page 19, I treated as a whim, the feeding cattle with raw potatoes, the reader ought to underſtand my meaning to be *labouring cattle.* But although ſuch conſiderable things are done, in the fattening way, with this excellent root in a raw ſtate, I am ſure the profit will always be greater, and the quality of the fleſh much ſuperior, from the root ſteemed or baked; and a commodious kiln, of a reaſonable price, which would bake or roaſt a large quantity of potatoes, is yet an object for the attention of our ingenious artiſts. Raw potatoes have been found

to

to injure milch-cows, rendering their milk ſo thin, as to be unfit even for ſuckling. Mr. Billingſley found the water in which potatoes had been boiled, injurious to hogs. Mr. Turner proved the ſame by experiment. The expenſes upon potatoes have generally amounted to ſix or ſeven pounds per acre, (on which, however, a conſiderable reduction may be made by improved culture); and if the experiments have been accurate, an acre, producing about 350 buſhels, will, with a little hay daily, completely fatten three large beaſts, put up with very little fleſh upon them, in from twelve to fifteen weeks, ſome roots being left.

HINTS ON FELLING TREES.

FROM THE COMMERCIAL AND AGRICULTURAL MAGAZINE, Vol. VII. LONDON, 1802.

ALL foreſt trees, whether felled with a ſaw or an axe, may be cut near the ground, at the ſame time carefully preſerving the ſtump and roots from any further injury.

The ſurface ſhould then be made quite ſmooth, when the compoſition may be ſpread over the whole ſurface, according to the directions given in your laſt number. It ſhould, however, be obſerved, that the compoſition when employed for this particular purpoſe, ſhould have an equal quantity of the powder of alabaſter, mixed with the dry powder, generally directed to be uſed, after the compoſition is laid on, in order to render the ſurface harder, and, of courſe, better able to reſiſt the bad effects of the dripping of trees, of rain, froſt and ſnow. But this addition is by no means neceſſary

eſſary in the uſual application to the ſides of the trees. In conſequence of this proceſs the vigour of the roots will operate ſo powerfully in the courſe of the ſucceeding ſpring, that a conſiderable number of buds or branches will ſhoot forth round the ſtump, which, with proper care and attention, may be trained to many valuable purpoſes, either ſtraight or crooked, for knee-timber or other purpoſes: and by retaining only ſo many of theſe ſhoots, as are deſigned to grow for any particular intention, more than one half will be ſaved in point of time, according to the proportions of common growth. For if a young tree be planted in a ſoil, equal in quality to the ſcite of the old ſtump, the ſhoot growing from the latter, will, in eight or ten years, attain to a ſize which the ſingle plant will hardly acquire in twice that period. There are alſo many uſeful purpoſes of huſbandry, as hoop-poles and other poles uſed on various occaſions, for which a number of ſhoots may be trained from one ſtump, whoſe fertile juices will ſhortly rear an healthy and numerous offspring around it. Very particular attention, however, ſhould be paid to regulate their number according to the ſize and vigour of the ſtump. It would certainly be proper to leave more of them at firſt than are intended to be reſerved for final uſe, in order to draw up the ſap: if too few are left, they will be liable to burſt, from the ſuperabundant flow of the juices from the old ſtock: to prevent which inconvenience they ſhould be cut away by degrees, always applying the compoſition as they are cut, and leaving the fineſt ſtem to produce the new tree, which will in time cover the old ſtump, and leave nothing but a faint kind of cicatrix, at the junction of the old and new part of the tree.

PRE-

PREVENTATIVE OF FLIES DESTROYING TURNIPS.

From the Agricultural and Commercial Magazine, Vol. vii. page 76.

THE diſcovery of a preventative of flies deſtroying turnip crops, for which 200 guineas were given at Mr. Coke's ſheep-ſhearing, is to ſow two pounds of radiſh ſeed on every acre of turnip land, with the turnip ſeed; which is found ſo to attract the flies, as to prevent their proving injurious to the turnips.

HAY HARVEST.

On the Uſe of Salt in curing Hay, particularly Clover.

Extracts from "Monk's Agricultural Dictionary."

LAST year Mr. Rodney made ten loads of ſaint-foine hay, which from repeated rains was ſo damaged, that his people pronounced it three quarters ſpoiled.

He ſalted it in ſtacking with only one buſhel of ſalt, and it completely recovered it.

Young's Eastern Tour. Vol. iii. page 203.

I ſalted about four loads of after-paſture clover hay, that was damaged ſo much by rains as to be thought more fit to be made dung of than hay; but this I do aver as a truth, that my horſes eat more and fed more heartily on this damaged, but *ſalted* hay, than they did upon that which was cut in full ſap; and ſtacked without rain. The experiment was tried by racking them ſometimes with one

one ſort, and ſometimes with the other. The nights they were racked with the beſt hay, they did not eat all that was given, but the nights in which they had the ſalted damaged hay, although a larger quantity was given, yet in the mornings their racks were found empty. The common quantity is a peck of ſalt to a load of hay.

YOUNG'S NORTHERN TOUR, Vol. i. p. 4. 1770.

MR. SCARANCKE, Hants.

As the ſeaſon for hay-making is drawing near, muſt beg leave to recommend the ſalting of ricks. I am perſuaded few farmers are aware of the benefit ariſing from this practice, particularly in ſtacking in ſultry weather. The ſalt preſerves the hay from overheating and becoming mildewed; it may be put together greener than otherwiſe, without any danger of firing. All kinds of cattle, &c. prefer inferior hay, thus managed, to the beſt that can be placed before them, that has not been ſalted; the ſalt aſſimilates with the juices of the hay, and thereby prevents too great a fermentation, and by its ſoporific quality gives it a ſuperior flavour. The proper method of uſing it is, in building the ſtack, to ſprinkle the ſalt alternately between each layer of hay, in the proportion of one hundred weight to ſeven or eight tons.

YOUNG'S ANNALS, Vol. vi. page 94. 1786.

Mr. T. BERNARD, near Ramſey.

This practice of curing hay with ſalt, ſo much recommended in the preceding extracts, has been tried in this country and neighbourhood. The following communications to the Truſtees of the Maſſachuſetts Society for promoting Agriculture, will ſhow with what ſucceſs.

A LETTER *from Mr.* ASA PACKARD, *to the Hon.* GEORGE CABOT, *Esq. Boston.*

Marlborough, Dec. 5th, 1803.

HONOURED AND DEAR SIR,

YOURS of 2d inst. was duly received, by post. In compliance with your polite request, I have consulted several of the most observing farmers in this vicinity, relative to the best process of curing clover. You refer particularly, in your inquiries, to the method adopted by Capt. George Williams, on which you have a partial recollection of conversing with him several years ago. His plan embraces the opinions and the prevailing practice of his most judicious neighbours. I have this day spent an hour with him, on the subject, and though he differs considerably from Dr. Dean, the experience of some years past justifies him in preferring his own method. He states the entire process as follows.

With all my labourers I enter the largest and most luxuriant growth of clover as soon as the dew is off; the fork follows the scythe as soon as possible. All that is mowed that day lies spread by 12 o'clock. About one, *before half past one*, it is turned with a fork. Towards night, say at six o'clock, it is thrown into small heaps, without a rake. Next morning, as soon as the ground is dry, these heaps are opened, not spread so as to cover the ground, but rather separated in moderate fork-loads. These are turned between 11 and 12 o'clock; and *at one* the cart should receive it, hot and heavy as it is. If dried more it will crumble, lose its leaves, its heads and its nutritive qualities.

When perfectly ready for the team, *juice* may be squeezed by the fingers from a single straw. From a wisp of it, the size of your hay-rope, a man may ring moisture, possibly a drop. Having thrown three

or

or four hundred, about equally, over a ten feet ſcaffold, ſtrew as many quarts of ſalt; then ſpread another ſtratum of hay and a ſimilar quantity of ſalt, till you have thrown *half a buſhel on a ton.* The top will need none.

Of his ordinary proceſs he gave me the following illuſtration in a ſimple ſtatement of facts.

"Laſt year I cut a ſmall piece of heavy clover. My men were belated, and a part of it was ſtanding at 12 o'clock. I managed it on that day as if it had been cut in ſeaſon. The next was tolerably good hay weather, not the beſt. Obſerving ſome ſigns of rain, I put down one load (about half the piece) on my ſcaffold at one of the clock. It appeared rather too green. On the ſucceeding morning it was covered on the ſcaffold with a large dew. The weather on the third day was remarkably drying, and though the load left in the field was moved as early as convenient, it crumbled; it was dried too much. This I placed upon the firſt load. Both did well, but the bottom of the ſcaffold was preferable,—the more valuable of the two."

Thus, Sir, I have realized the pleaſure of ſtating to you particularly, the moſt approved proceſs of curing clover, known in this vicinity.

With very much eſteem and unfeigned reſpect, honoured Sir, your moſt humble ſervant,

ASA PACKARD.

A LETTER

A LETTER *from* SAMUEL W. POMEROY, *Esq. to the Rev. Dr.* PARKER, *Corresponding Secretary to the Society for promoting Agriculture in Massachusetts.*

Cambridge, 15th May, 1804.

SIR,

AGREEABLY to your request, I have the pleasure to relate the following experiments on clover cured with salt, about the middle of July, 1802. The produce of less than an acre of clover, supposed to be two tons when dry, was cut between 9 and 12 o'clock, and immediately spread; it covered the ground very thick; by 5 o'clock it was made up into cocks, and the next day, without opening, was carried to the barn, put upon a scaffold, and mowed in a form nearly square. As it was spread upon the mow, *two bushels of refuse salt* from the provision barrels, was strewed upon it as equally as possible; it was very green, and my foreman observed, that it would in a short time be thrown into the yard for manure.

The winter following this hay came out perfectly sweet, of a good colour, and was eaten freely by horses and oxen; even the stalks, which were large, were not left.

The beginning of last July, a field of six acres of clover, supposed, when dry, to produce ten tons, was cut from 8 to 3 o'clock, and a part spread. Before 5 o'clock the whole was made up into small cocks, some of which had not been cut two hours. The next day, none of it was opened, the carts were in the field by 9 o'clock, and before sunset the whole, which made fifteen heavy loads, was carried to the barn, put into a bay and formed a mow fourteen feet high. On each layer of clover, of about one fourth of a load, was strewed coarse Liverpool salt, in the proportion of three pecks to a ton; this clover was drier when cut than that men-

 tioned

tioned in the firſt experiment, though half of it was not in bloom, and few heads had turned brown; but owing to the drought it began to waſte. The evening it was carted conſiderable heat was obſerved by thruſting the hand as far as one could reach into the mow; the next morning however no heat was perceived, nor was there afterwards the leaſt appearance of fermentation. A few days after three tons more, managed in the ſame way, was added to the mow, which was ſuppoſed to contain thirteen tons of dry hay. The whole of this hay came out very bright and ſweet; ſome of it has been ſold in the market at a higher price in proportion to other hay at the ſame time, than clover cured in the common way generally bears. My horſes have been kept upon it for three months paſt, and I never had them look ſo well with ſo little grain; they appear more fond of it than of other hay, and there is leſs left in the manger.

It may be proper to remark, that the weather, when the clover was cut and carried, was very fine; and that the cocks upon the moiſt land were turned bottom upwards half an hour before they were put upon the cart. How this method will anſwer in cloudy weather, or when the clover has been wet, muſt be determined by other experiments.

I am, Sir, with much reſpect, your very obedient ſervant,

SAMUEL WYLLYS POMEROY.

Dr. *The Maſſachuſetts Society for promoting Agri-*

1802.			
July 22.	To Jacob Kuhn, paid him for one year's ſervices - -	25	
Auguſt. 31.	Paid Joſeph Callendar for printing 200 Certificates. -	8	56
Dec. 9.	Paid ditto for a Gold Medal preſented by the Society to the Hon. David Humphreys - - - - - -	48	
1803.			
Jan. 18.	Paid James Allen for his exertions in raiſing trees - - - - - - - - - - - - - - - - - - 20.		
	Paid poſtage of a letter from Benj Vaughan, Eſq. - - - - - - - - - - - - - - - - - - - 1. 36	21	36
Mar. 16.	Paid Seth Adams the Society's premium for importing ſheep - - - - - - - - - - - - - - - -	50	
June 3.	Paid for ſixper cent defer'd Stock, dolls. 900 nominal -	845	11
		998	3
8.	Balance due to the Society to adjuſt this Account	88	39
	DOLLARS	1086	42

Memorandum of the Society's property in the hands of the Treaſurer.

United States ſix per cent ſtock, nominal ſum - - -	3800
Ditto defer'd ditto - - - - - - - - - - -	2200
Ditto three per cent ſtock - - - -	583
Maſſachuſetts State notes - - - - - - - - - - - - - -	960
United States Bank ſtock - - - - - - - - - - - - - -	1200
DOLLARS	8743

culture in Account with Thomas Lindall Winthrop. Cr.

1802.			
June 9.	By Balance due to the Society per account ſettled under this date - - - - - - - - - - - - - - - -	69	94
July 6.	By 3 months Intereſt on 3800 dolls. ſix per cent ſtock - 57.		
	3 mos. Int. on 1300. ditto deferred - - - 19.50		
	3 mos. Int. on 583. three per cent ſtock - 4.37		
	6 mos. Int. on 1200. Maſſ. State notes - - 30.		
	6 mos. div'd. on 1200. U. S. Bank ſtock - - 54.		
	Rec'd. of Jacob Kuhn for ſundry aſſeſſments 28.		
		192	87
Oct. 8.	By 3 mos. Int. on 3800. ſix per cent ſtock - - 57.		
	3 mos. Int. on 1300. ditto defer'd - - - - 19.50		
	3 mos. Int. on 583. three per cent ſtock - 4.37		
		80	87
1803.			
Jan. 6.	By 3 mos. Int. on 3800. ſix per cent ſtock - - 57.		
	2 per ct. on ditto, ditto paid by Gov. - - 76.		
	3 mos. Int. on 1300. ditto defer'd - - - - 19.50		
	2 per cent on ditto - - - - - - - - - - - - 26.		
	3 mos. Int. on 583. three per cent ſtock - 4.37		
	6 mos. Int. on 1200. Maſſ. State notes - - 30.		
	20 per cent. on ditto, paid by Gov. - - - - 240.		
	6 mos. dividend on 1200. U. S. Bank ſtock 54.		
		506	87
	By ſundry aſſeſſments rec'd. of Jacob Kuhn - - - -	42	
April 4.	By 3 mos. Int. on 3800. ſix per cent ſtock - - 57.		
	3 mos. Int. on 1300. ditto defer'd - - - - 19.50		
	3 mos. Int. on 583. three per cent ſtock - 4.37		
June 3.	Rec'd of Jacob Kuhn for ſundry aſſeſſments 113.		
		193	87
	DOLLARS	1086	42

BOSTON, June 8th, 1803.
Errors excepted.
THOMAS L. WINTHROP.

We the ſubſcribers, appointed a Committee by the Maſſachuſetts Society for promoting Agriculture, at their annual meeting in January laſt, to examine the Treaſurer's account, having attended to that buſineſs, do find the ſame well vouched and right caſt, and a balance of eighty-eight dollars and thirty-nine cents due to ſaid Society from ſaid Treaſurer. We alſo find in his hands the evidences of the property enumerated above.

BOSTON, June 8th, 1803. WM. SPOONER, JOSHUA THOMAS, } Committee.

Harry Mere

Joseph Read
Rutland

Benny Hooker
Rutland

John Read