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THE
 ILLUSTRATED
 ANNUAL
 REGISTER
 OF
 RURAL AFFAIRS
 FOR
 1869.

130 ENGRAVINGS.

ALBANY,
 N.Y.,
 Luther Tucker & Son,
 No. 15.

ROSSING-BARFITT, ST. N.Y.

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LUTHER TUCKER & SON, *Editors and Proprietors,*

ALBANY, N. Y.

THE

ILLUSTRATED ANNUAL

REGISTER OF RURAL AFFAIRS

AND

CULTIVATOR ALMANAC

FOR THE YEAR 1869,

CONTAINING

PRACTICAL SUGGESTIONS FOR THE FARMER
AND HORTICULTURIST.

With about 130 Engravings.

BY J. J. THOMAS,

AUTHOR OF THE 'AMERICAN FRUIT CULTURIST,' AND 'FARM IMPLEMENTS,'
ASSOCIATE EDITOR OF THE 'CULTIVATOR & COUNTRY GENTLEMAN.'

ALBANY, N. Y.:

LUTHER TUCKER & SON, 395 Broadway.

1869.

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PUBLISHERS' ADVERTISEMENT.

THE ILLUSTRATED ANNUAL REGISTER OF RURAL AFFAIRS has now been before the public so long that it is scarcely necessary to speak again of its purposes and value. It was the pioneer Annual of its kind in America, and of the Series of which the Fifteenth Number is now before the reader, probably about Quarter of a Million copies have been sold, and scattered through every State in the Union. The present issue will be found, it is believed, no less interesting and useful than its predecessors. Among agricultural crops, Wheat and the Potato are both treated at length; and a practical essay on Hedges and their Management is given. In horticulture, there are numerous and timely articles on various topics, and the author of "Ten Acres Enough" describes "Strawberry Marketing in New-Jersey." The author of "Country Life" contributes an article on Laying out Country Places, with several plans from his own practice in Landscape Gardening. There is the usual variety of other articles, on Farming, Fruits and Flowers, Domestic Animals and Domestic Economy—the whole illustrated with fully the usual number of Engravings.

In like manner, the previous Numbers contain a vast store of information on every branch of Husbandry and Horticulture, and are especially rich in Designs for Farm and Country Houses and Working Men's Cottages—on Ornamental Planting and the care of Gardens and Grounds,—and on related topics, such as fences and gates, architecture generally, vegetable physiology, entomology, farm and horticultural implements, the care of domestic animals, hints for housekeepers, underdraining, butter and cheese making, poultry and bee-keeping, &c., &c.—thus constituting in fact a LIBRARY in themselves.

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The Publishers have also the Numbers in paper covers, as they originally appeared, (with the exception of those for 1855, '57, '60 and '63,) either of which may at any time be obtained by remitting Thirty Cents, or any four of them for One Dollar, enclosed by Mail to LUTHER TUCKER & SON, *Albany, N. Y.*, who will also send the bound volumes post-paid, at the price above named, except to those districts only reached by the Overland Mail. A *Fifth Volume* is now in press, to contain the Numbers for 1867, '68 and '69—price \$1.50, on heavy paper and handsomely bound.

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Implements and Inventions.—Mechanical Contrivances for various purposes—the Implements of Horticulture—new Machines—largely illustrated.

Woodlands.—Planting Timber for Screens—the care and Culture of the Timber Crop.

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THE CULTIVATOR ALMANAC, FOR 1869.

ASTRONOMICAL CALCULATIONS IN EQUAL OR CLOCK TIME.

ECLIPSES FOR THE YEAR 1869.

THERE WILL BE FOUR ECLIPSES THIS YEAR, two of the Sun and two of the Moon, as follows :

I. A Partial Eclipse of the Moon, January 27th, in the evening ; visible. Size, $5\frac{1}{2}$ digits on the northern limb. In California and Oregon the Moon will rise eclipsed.

II. An Annular Eclipse of the Sun February 11th ; invisible in North America, but visible in the southern part of South America and in South Africa.

III. A Partial Eclipse of the Moon July 23d ; invisible in North America.

IV. A Total Eclipse of the Sun August 7th, (Saturday,) in the afternoon ; visible as such in part of Iowa, Illinois, Kentucky, West Virginia and North Carolina. The Eclipse will be total at noon in Alaska, lat. $61^{\circ} 46.9'$ north, long. $68^{\circ} 4.6'$ west of Washington. The line of central and total eclipse from thence runs southeasterly, touching the coast near Sitka ; thence passes into British America, and enters the United States near the origin of Milk river, long. 30° W. From thence it passes through the southwest corner of Minnesota, crosses the Mississippi river near Burlington, Iowa, and proceeds through Illinois just north of Springfield, and crosses the Ohio river near Louisville. It then runs through Kentucky and North Carolina, passing just south of Raleigh, and entering the Atlantic near Newbern and Beaufort, N. C. North of this line the Eclipse will be partial, the southern limb being eclipsed ; and south of the line it will also be partial, the northern limb being eclipsed. See the following table for the times of its phases :

PRINCIPAL PLACES.	Eclipse of the Moon Jan. 27th.			Eclipse of the Sun Aug. 7th.			PRINCIPAL PLACES.	Eclipse of the Moon Jan. 27.			Eclipse of the Sun Aug. 7th.		
	Begins.	Middle.	Ends.	Begins.	Ends.	Digits.		Begins.	Middle.	Ends.	Begins.	Ends.	Digits.
	H. M.	H. M.	H. M.	H. M.	H. M.			H. M.	H. M.	H. M.	H. M.	H. M.	
Bangor, Me.,	7 52	9 2	10 12	5 31	At	$7\frac{3}{4}$	Nashville, . . .	6 41	7 51	9 1	4 23	6 21	$11\frac{1}{4}$
Portl'nd, Me.	7 47	8 57	10 7	5 26	sun-	$8\frac{1}{4}$	Chicago, Ill.,	6 38	7 48	8 58	4 7	6 6	$11\frac{1}{4}$
Boston, . . .	7 44	8 54	10 4	5 24	set.	9	Milwaukee, . . .	6 35	7 45	8 55	4 1	6 2	11
Quebec, . . .	7 43	8 53	10 3	5 18	6 59	$7\frac{1}{2}$	Mobile, Ala.,	6 35	7 45	8 55	4 32	6 20	$9\frac{1}{2}$
Montreal, . . .	7 34	8 44	9 54	5 9	6 54	$8\frac{1}{4}$	New-Orleans, . .	6 28	7 38	8 48	4 24	6 13	9
Albany, N. Y.	7 33	8 43	9 53	5 12	6 55	$9\frac{1}{2}$	St. Louis, Mo.	6 27	7 37	8 47	4 5	6 3	$11\frac{1}{2}$
New-York, . .	7 32	8 42	9 52	5 12	s.set	10	Dubuque, . . .	6 25	7 35	8 45	3 50	5 53	$11\frac{1}{2}$
Philadelphia,	7 28	8 38	9 48	5 8	6 53	$10\frac{1}{4}$	Little Rock, . .	6 20	7 30	8 40	4 1	6 1	$10\frac{1}{4}$
Baltimore, . .	7 22	8 32	9 42	5 3	6 53	$10\frac{1}{2}$	St. Paul, Minn	6 16	7 26	8 36	3 36	5 36	$11\frac{1}{4}$
Washington,	7 20	8 31	9 41	5 2	6 52	11	Portland, Or., .	Inv. 5	28 6	38 1	11 3	28 8	$8\frac{1}{2}$
Richmond, . .	7 18	8 28	9 38	5 1	6 51	$11\frac{1}{2}$	San Francisco, Inv.	5 28	6 38	1 26	3 38	6	$6\frac{1}{2}$
Buffalo, N. Y.	7 13	8 23	9 33	4 49	6 39	10	Rochester, . . .	7 17	8 27	9 37	4 49	6 42	$9\frac{3}{4}$
Raleigh, N C	7 13	8 23	9 33	4 58	6 51	$11\frac{3}{8}$	Cleveland, O.,	7 08	8 10	9 20	4 34	6 26	$10\frac{3}{8}$
Toronto, . . .	7 11	8 21	9 31	4 43	6 36	$9\frac{3}{4}$	Syracuse, N. Y.	7 24	8 34	9 44	4 58	6 47	$9\frac{1}{2}$
Charleston, . .	7 8	8 18	9 28	5 0	6 48	11	Utica, N. Y., . .	7 28	8 38	9 48	5 2	6 50	$9\frac{1}{2}$
Savannah, . .	7 4	8 14	9 24	4 57	6 46	$10\frac{3}{4}$	Indianapolis, . .	6 44	7 54	9 4	4 21	6 14	$11\frac{3}{8}$
Detroit, Mich	6 56	8 6	9 16	4 31	6 26	$10\frac{1}{2}$	Oswego, N. Y.	7 23	8 33	9 43	4 55	6 45	$9\frac{1}{2}$
Cincinnati, O	6 51	8 1	9 11	4 30	6 25	$11\frac{3}{4}$	Wilmington, . .	7 25	8 35	9 45	5 6	6 51	$10\frac{1}{2}$
Louisville, . .	6 46	7 56	9 6	4 26	6 22	12							

MORNING AND EVENING STARS.

MORNING STARS.—Venus until May 9. Mars not this year. Jupiter from April 17th to August 12th. Saturn until March 7th.

EVENING STARS.—Venus from May 9th to end of year. Mars all the year. Jupiter until April 17th and after August 12th. Saturn from March 7th to December 11th.

THE FOUR SEASONS.

		D. H. M.		D. H. M.
Winter begins	December, 1868,	21—7	20 mo., and lasts	89 0 56
Spring do.	March, 1869,	20—8	16 mo., do.	92 20 34
Summer do.	June, 1869,	21—4	50 mo., do.	93 14 22
Autumn do.	September, 1869,	22—7	12 eve., do.	89 17 56
Winter do.	December, 1869,	21—1	8 eve. Trop. year	365 5 48

CYCLES OF TIME AND CHURCH DAYS.

Dominical Letter,.....	C	Septuagesima Sund., Jan. 24	Easter Sunday,	Mar. 28	
Epact,.....	17	Sexagesima do. Jan. 31	Low Sunday,	April 4	
Golden Number,.....	8	Quinquagesima do. Feb. 7	Rogation Sunday,..	May 2	
Solar Cycle,.....	2	Ash Wednesday,.....	Feb. 10	Ascension Day,....	May 6
Roman Indiction,.....	12	Quadragesima Sund.,	Feb. 14	Pentecost Day,....	May 16
Jewish Lunar Cycle,...	5	Mid-Lent Sunday,...	Mar. 7	Trinity Sunday,...	May 23
Dionysian Period,.....	198	Palm Sunday,.....	Mar. 21	Middle of the Year, July	2
Julian Period,.....	6582	Good Friday,.....	Mar. 26	Advent Sunday,....	Nov. 28

PLANETARY NOTES.

MERCURY will be in a favorable position to be seen February 1st, May 26th and September 22d, being then brightest, and setting soon after the Sun. Also March 21st and July 19th and November 7th, being then brightest again, and in the east before sunrise.

MARS will be brightest about February 13th, rising about sunset.

JUPITER will be brightest November 8th, rising about sunset.

SATURN will be brightest June 4th, rising about sunset.

VENUS will not be very conspicuous until towards the close of the year. Until October its form will not vary much from a circle, but its phase becomes very gibbous then; and at the time of its greatest eastern elongation from the Sun, December 13th, it becomes a half circle of large size; and after that it becomes a crescent.

SATURN'S RINGS.

These rings will be visible all this year, the visual line making an angle of little more than 26° with the plane of the rings. Their northern surface is visible, the Sun and Earth being elevated above that side. They appear elliptical, and this year rather more than twice as long as wide.

PETROLEUM as an article of fuel has been employed with remarkable success, generating steam for boilers with great effectiveness and economy. Steam vessels may thus carry fuel for much longer voyages than if dependent on coal.

THE DURABILITY OF TIMBER, when so situated as to remain perfectly dry, is almost unlimited. The roof of Westminster Hall is more than 450 years old, and the supports of a church roof at Rome were sound and good after the lapse of 1,000 years.

MOON'S PHASES.		BOSTON.	NEW-YORK.	WASHINGTON	SUN ON MERID.	
	D.	H. M.	H. M.	H. M.	D.	H. M. S.
THIRD QUARTER	5	1 39 mo.	1 27 mo.	1 15 mo.	1	12 3 36
NEW MOON, . . .	12	2 9 ev.	1 57 ev.	1 45 ev.	9	12 7 36
FIRST QUARTER,	20	7 42 ev.	7 30 ev.	7 18 ev.	17	12 10 33
FULL MOON, . . .	27	8 46 ev.	8 34 ev.	8 22 ev.	25	12 12 44

DAY OF MONTH.	DAY OF WEEK.	CALENDAR				CALENDAR				CALENDAR							
		For Boston, New-England, New-York State, Michigan, Wisconsin, Iowa, and Oregon.								For New-York City, Philadelphia, Connecticut, N. Jersey, Penn., Ohio, Indiana and Illinois.				For Washington, Maryl'd, Virginia, Kent'ky, Miss'ri, and California.			
		SUN RISES	SUN SETS.	MOON RISES.	H. W. BOST'N	SUN RISES	SUN SETS.	MOON RISES.	H. W. N. Y.	SUN RISES	SUN SETS.	MOON RISES.					
1	F	7 30	4 38	8 38	1 55	7 25	4 43	8 40	10 37	7 19	4 49	8 43					
2	S	7 30	4 39	9 48	2 46	7 25	4 44	9 50	11 29	7 19	4 50	9 52					
3	C	7 30	4 40	10 57	3 37	7 25	4 45	10 58	ev. 23	7 19	4 51	10 59					
4	M	7 30	4 41	morn	4 30	7 25	4 46	morn.	1 18	7 19	4 52	morn.					
5	T	7 30	4 42	0 6	5 29	7 25	4 47	0 6	2 15	7 19	4 52	0 6					
6	W	7 29	4 43	1 12	6 27	7 25	4 48	1 11	3 13	7 19	4 53	1 9					
7	T	7 29	4 44	2 18	7 30	7 25	4 49	2 16	4 14	7 19	4 54	2 14					
8	F	7 29	4 45	3 22	8 26	7 24	4 50	3 19	5 11	7 19	4 55	3 16					
9	S	7 29	4 46	4 25	9 20	7 24	4 51	4 21	6 6	7 19	4 56	4 17					
10	C	7 29	4 47	5 21	10 11	7 24	4 52	5 17	6 57	7 19	4 57	5 13					
11	M	7 29	4 48	6 18	10 59	7 24	4 53	6 14	7 42	7 19	4 58	6 9					
12	T	7 28	4 50	sets.	11 42	7 23	4 54	sets.	8 24	7 18	4 59	sets.					
13	W	7 28	4 51	5 59	morn.	7 23	4 55	6 2	9 8	7 18	5 0	6 7					
14	T	7 28	4 52	6 55	0 22	7 23	4 56	6 59	9 48	7 18	5 1	7 2					
15	F	7 27	4 53	7 54	1 2	7 22	4 57	7 56	10 25	7 18	5 2	7 59					
16	S	7 27	4 54	8 50	1 41	7 22	4 59	8 52	11 2	7 17	5 3	8 53					
17	C	7 26	4 55	9 48	2 20	7 21	5 0	9 49	11 43	7 17	5 5	9 49					
18	M	7 26	4 56	10 44	2 58	7 21	5 1	10 44	morn.	7 16	5 6	10 44					
19	T	7 25	4 58	11 41	3 39	7 21	5 2	11 40	0 25	7 16	5 7	11 40					
20	W	7 24	4 59	morn.	4 23	7 20	5 3	morn.	1 10	7 15	5 8	morn.					
21	T	7 24	5 0	0 41	5 12	7 19	5 4	0 40	1 58	7 15	5 9	0 38					
22	F	7 23	5 1	1 41	6 6	7 18	5 5	1 38	2 52	7 14	5 10	1 36					
23	S	7 22	5 3	2 42	7 5	7 17	5 7	2 39	3 50	7 14	5 11	2 35					
24	C	7 22	5 4	3 36	8 7	7 17	5 8	3 42	4 52	7 13	5 12	3 38					
25	M	7 21	5 5	4 50	9 9	7 16	5 9	4 45	5 55	7 12	5 13	4 41					
26	T	7 20	5 6	rises.	10 8	7 16	5 10	rises.	6 54	7 12	5 15	rises.					
27	W	7 19	5 8	5 1	11 6	7 15	5 11	5 5	7 49	7 11	5 16	5 10					
28	T	7 18	5 9	6 15	11 57	7 14	5 13	6 18	8 40	7 10	5 17	6 21					
29	F	7 17	5 10	7 28	ev. 47	7 13	5 14	7 30	9 32	7 9	5 18	7 33					
30	S	7 16	5 12	8 41	1 37	7 12	5 15	8 43	10 22	7 8	5 19	8 44					
31	C	7 15	5 13	9 52	2 25	7 12	5 16	9 52	11 8	7 8	5 20	9 53					

AGRICULTURAL MEMORANDA—Oct. 1, 1867, to Oct. 1, 1868, with references to date of the COUNTRY GENTLEMAN containing particulars:

Agricultural Annual. Published by O. Judd & Co., New-York—Jan. 30, 1868.

Agricultural Bureau established in Canada—Feb. 13, 1868.

Alderneys—Importation by M. H. Cochrane, Montreal, Sept. 3, 1868. By D. B. Fearing, Newport, R. I.—Sept. 17, 1868. By C. L. Sharpless, Philadelphia—June 18, 1868. By Sheldon Stephens, Montreal—Aug. 20, 1868.

Alexander, R. A., Spring Station, Ky. Obituary—Dec. 12, 1867.

MOON'S PHASES.		BOSTON.		NEW-YORK.	WASHINGTON	SUN ON MERID.	
	D.	H. M.		H. M.	H. M.	D.	H. M. S.
THIRD QUARTER	3	0 12 ev.		12 0 mo.	11 48 mo.	1	12 13 55
NEW MOON, . . .	11	9 10 mo.		8 58 mo.	8 46 mo.	9	12 14 29
FIRST QUARTER,	19	0 22 ev.		0 10 ev.	11 58 mo.	17	12 14 31
FULL MOON, . . .	26	7 20 mo.		7 8 mo.	6 56 mo.	25	12 13 12

DAY OF MONTH.	DAY OF WEEK.	CALENDAR				CALENDAR				CALENDAR							
		For Boston, New-England, New-York State, Michigan, Wisconsin, Iowa, and Oregon.								For New-York City, Philadelphia, Connecticut, N. Jersey, Penn., Ohio, Indiana and Illinois.				For Washington, Maryl'd, Virginia, Kent'ky, Miss'ri, and California.			
		SUN RISES	SUN SETS.	MOON RISES.	H. W. BOST'N	SUN RISES	SUN SETS.	MOON RISES.	H. W. N. Y.	SUN RISES	SUN SETS.	MOON RISES.					
		H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M				
1	M	7 14	5 14	11 2	3 14	7 11	5 18	11 1	11 59	7 7	5 21	11 1					
2	T	7 13	5 15	morn.	4 4	7 10	5 19	morn.	ev. 51	7 6	5 23	morn.					
3	W	7 12	5 16	0 10	5 0	7 9	5 20	0 8	1 47	7 5	5 24	0 6					
4	T	7 11	5 18	1 15	6 0	7 7	5 21	1 12	2 46	7 4	5 25	1 9					
5	F	7 10	5 19	2 17	7 0	7 6	5 22	2 14	3 46	7 3	5 26	2 10					
6	S	7 9	5 21	3 18	8 0	7 5	5 23	3 14	4 46	7 2	5 27	3 10					
7	C	7 8	5 22	4 13	8 58	7 4	5 25	4 8	5 43	7 1	5 28	4 4					
8	M	7 6	5 23	5 3	9 49	7 3	5 26	4 59	6 35	7 0	5 29	4 54					
9	T	7 5	5 24	5 49	10 36	7 2	5 27	5 45	7 21	6 59	5 30	5 40					
10	W	7 4	5 25	6 29	11 18	7 1	5 28	6 25	8 1	6 58	5 32	6 21					
11	T	7 2	5 26	sets.	11 55	7 0	5 30	sets.	8 40	6 57	5 33	sets.					
12	F	7 1	5 28	6 43	morn	6 58	5 31	6 45	9 21	6 55	5 34	6 47					
13	S	7 0	5 29	7 40	0 34	6 57	5 32	7 42	9 57	6 54	5 35	7 43					
14	C	6 59	5 30	8 37	1 11	6 56	5 34	8 38	10 31	6 53	5 36	8 38					
15	M	6 57	5 32	9 34	1 47	6 55	5 35	9 34	11 7	6 52	5 38	9 33					
16	T	6 56	5 33	10 31	2 24	6 53	5 36	10 30	11 47	6 51	5 39	10 28					
17	W	6 54	5 35	11 30	3 2	6 52	5 37	11 28	morn	6 49	5 40	11 25					
18	T	6 53	5 36	morn.	3 45	6 51	5 39	morn.	0 31	6 48	5 41	morn.					
19	F	6 52	5 38	0 29	4 34	6 49	5 40	0 26	1 21	6 47	5 42	0 23					
20	S	6 50	5 39	1 30	5 30	6 48	5 41	1 26	2 16	6 46	5 44	1 23					
21	C	6 48	5 40	2 32	6 33	6 46	5 43	2 28	3 19	6 44	5 45	2 24					
22	M	6 47	5 42	3 31	7 40	6 45	5 44	3 27	4 25	6 43	5 46	3 22					
23	T	6 45	5 43	4 28	8 47	6 44	5 45	4 23	5 32	6 42	5 47	4 19					
24	W	6 44	5 45	5 21	9 49	6 42	5 46	5 17	6 35	6 40	5 48	5 13					
25	T	6 42	5 46	6 10	10 48	6 41	5 48	6 7	7 32	6 38	5 49	6 3					
26	F	6 41	5 47	rises.	11 38	6 39	5 49	rises.	8 20	6 37	5 51	rises.					
27	S	6 39	5 49	7 30	ev. 25	6 38	5 50	7 31	9 12	6 36	5 52	7 31					
28	C	6 38	5 50	8 42	1 14	6 37	5 51	8 42	10 0	6 34	5 53	8 41					

Alexander, A. J., Spring Station, Ky. Public Sale of Horses—July 2, 1868.
 American Poultry Society Organized—Oct. 17, 1867.
 American Stud Book, by J. H. Wallace—Nov. 14, 1867
 Angora Goats, Imported by I. S. Diehl—Dec. 12, 1867.
 Arms, H. M., Springfield, Vt. Short-Horn Herd established—May 28, 1868.
 Bliss & Son, B. K., removal to New-York—Oct. 3, 1867.
 Book of Evergreens, by Josiah Hoopes—June 25, 1868.
 Boudinott Strawberry Introduced—July 2 and 30, 1868.
 Brittany Cattle imported by C. L. Flint and Gen. Paine, Boston, Mass.—July 2, 1868.

MOON'S PHASES.		BOSTON.	NEW-YORK.	WASHINGTON	SUN ON MERID.	
	D.	H. M.	H. M.	H. M.	D.	H. M. S.
THIRD QUARTER	5	0 59 mo.	0 47 mo.	0 35 mo.	1	12 12 27
NEW MOON, . . .	13	4 2 mo.	3 50 mo.	3 38 mo.	9	12 10 36
FIRST QUARTER,	21	1 10 mo.	0 58 mo.	0 46 mo.	17	12 8 22
FULL MOON, . . .	27	4 49 ev.	4 37 ev.	4 25 ev.	25	12 5 57

DAY OF MONTH.	DAY OF WEEK.	CALENDAR For Boston, New-England, New-York State, Michigan, Wisconsin, Iowa, and Oregon.				CALENDAR For New-York City, Phila- delphia, Connecticut, N. Jersey, Penn., Ohio, In- diana and Illinois.				CALENDAR For Washington, Maryl'd, Virginia, Kent'ky, Miss'ri, and California.			
		SUN RISES	SUN SETS.	MOON RISES.	H. W. BOST'N	SUN RISES	SUN SETS.	MOON RISES.	H. W. N. Y.	SUN RISES	SUN SETS.	MOON RISES.	
		H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	
1	M	6 36	5 51	9 53	2 2	6 35	5 53	9 52	10 44	6 33	5 54	9 50	
2	T	6 35	5 52	11 3	2 49	6 34	5 53	11 1	11 32	6 32	5 55	10 58	
3	W	6 33	5 53	morn	3 38	6 32	5 54	morn	ev. 24	6 30	5 56	morn.	
4	T	6 31	5 54	0 9	4 33	6 30	5 55	0 5	1 20	6 29	5 57	0 2	
5	F	6 30	5 55	1 12	5 32	6 29	5 56	1 8	2 18	6 27	5 57	1 4	
6	S	6 28	5 56	2 9	6 32	6 27	5 57	2 4	3 20	6 26	5 58	2 0	
7	C	6 26	5 57	3 1	7 35	6 25	5 58	2 57	4 20	6 24	5 59	2 52	
8	M	6 25	5 58	3 47	8 31	6 24	5 59	3 43	5 16	6 23	6 0	3 39	
9	T	6 23	5 59	4 30	9 22	6 22	6 0	4 26	6 8	6 21	6 1	4 22	
10	W	6 21	6 0	5 6	10 8	6 20	6 1	5 3	6 54	6 20	6 2	4 59	
11	T	6 20	6 2	5 38	10 51	6 19	6 2	5 36	7 35	6 18	6 3	5 33	
12	F	6 18	6 3	6 7	11 27	6 17	6 3	6 5	8 10	6 17	6 4	6 3	
13	S	6 16	6 4	sets.	morn.	6 16	6 4	sets.	8 48	6 15	6 5	sets.	
14	C	6 14	6 5	7 28	0 3	6 14	6 5	7 28	9 24	6 13	6 6	7 28	
15	M	6 13	6 6	8 25	0 38	6 12	6 6	8 24	10 1	6 12	6 7	8 23	
16	T	6 11	6 7	9 24	1 15	6 11	6 8	9 22	10 38	6 10	6 8	9 20	
17	W	6 9	6 9	10 24	1 54	6 9	6 9	10 21	11 15	6 9	6 9	10 18	
18	T	6 7	6 10	11 24	2 33	6 7	6 10	11 20	morn.	6 7	6 10	11 17	
19	F	6 6	6 11	morn.	3 17	6 6	6 11	morn.	0 2	6 6	6 11	morn.	
20	S	6 4	6 12	0 24	4 6	6 4	6 12	0 20	0 53	6 4	6 12	0 15	
21	C	6 2	6 13	1 22	5 5	6 2	6 13	1 18	1 52	6 3	6 13	1 13	
22	M	6 0	6 14	2 19	6 10	6 1	6 14	2 14	2 57	6 1	6 14	2 10	
23	T	5 59	6 15	3 10	7 20	5 59	6 15	3 6	4 5	5 59	6 15	3 2	
24	W	5 57	6 17	3 59	8 28	5 58	6 16	3 55	5 13	5 58	6 16	3 51	
25	T	5 55	6 18	4 43	9 30	5 56	6 17	4 40	6 16	5 56	6 17	4 37	
26	F	5 53	6 19	5 22	10 26	5 54	6 18	5 20	7 12	5 54	6 18	5 18	
27	S	5 52	6 20	rises.	11 17	5 52	6 19	rises.	7 59	5 53	6 19	rises.	
28	C	5 50	6 21	7 39	ev. 2	5 51	6 20	7 38	8 47	5 51	6 19	7 37	
29	M	5 48	6 22	8 42	0 48	5 49	6 21	8 39	9 34	5 50	6 20	8 36	
30	T	5 46	6 23	9 52	1 36	5 47	6 22	9 49	10 21	5 48	6 21	9 46	
31	W	5 45	6 24	10 57	2 23	5 46	6 23	10 54	11 6	5 47	6 22	10 50	

Cameron, R. W., New-York. Public Sale of Stock—Nov. 28, 1867.
 Canada East. Exhibition at Montreal—Sept. 24, 1868.
 Cattle in America, by Lewis F. Allen—April 23, 1868.
 Channel Island Cattle—Sale of the Dauncey Herd—Nov. 21, 1867.
 Clark, C. M., Springfield, Ohio. Sale of Short-Horn Herd to Mr. McMillan—
 Nov. 14, 1867.
 Cornell University, its Professorships, &c.—Feb. 6 & 20, 1868.
 Cornell, Ezra, receives degree of LL.D.—June 25, 1868.

MOON'S PHASES.		BOSTON.	NEW-YORK.	WASHINGTON	SUN ON MERID.	
	D.	H. M.	H. M.	H. M.	D.	H. M. S.
THIRD QUARTER	3	4 4 ev.	3 52 ev.	3 40 ev.	1	12 3 48
NEW MOON, . . .	11	9 3 ev.	8 51 ev.	8 39 ev.	9	12 1 29
FIRST QUARTER,	19	10 22 mo.	10 10 mo.	9 58 mo.	17	11 59 26
FULL MOON, . . .	26	1 37 mo.	1 25 mo.	1 13 mo.	25	11 57 48

DAY OF MONTH.	DAY OF WEEK.	CALENDAR For Boston, New-England, New-York State, Michi- gan, Wisconsin, Iowa, and Oregon.				CALENDAR For New-York City, Phila- delphia, Connecticut, N. Jersey, Penn., Ohio, In- diana and Illinois.				CALENDAR For Washington, Maryl'd, Virginia, Kent'ky, Miss'ri, and California.													
		SUN RISES		SUN SETS.		MOON RISES.		H. W. BOST'N		SUN RISES		SUN SETS.		MOON RISES.									
		H	M	H	M	H	M	H	M	H	M	H	M	H	M	H	M						
1	T	5	43	6	25	12	0	3	13	5	44	6	24	11	56	11	58	5	46	6	23	11	51
2	F	5	41	6	27	morn.		4	5	5	42	6	26	morn	ev.	52			5	44	6	24	morn.
3	S	5	40	6	28	0	56	5	3	5	41	6	27	0	51	1	50	5	42	6	25	0	47
4	C	5	38	6	29	1	46	6	4	5	39	6	28	1	42	2	50	5	41	6	26	1	37
5	M	5	36	6	30	2	29	7	2	5	37	6	29	2	25	3	47	5	39	6	27	2	21
6	T	5	35	6	31	3	7	7	57	5	36	6	30	3	3	4	42	5	37	6	28	2	59
7	W	5	33	6	32	3	41	8	49	5	34	6	31	3	38	5	34	5	36	6	29	3	35
8	T	5	31	6	33	4	11	9	34	5	33	6	22	4	9	6	20	5	34	6	30	4	6
9	F	5	30	6	34	4	39	10	16	5	31	6	33	4	38	7	2	5	33	6	31	4	37
10	S	5	28	6	36	5	7	10	56	5	30	6	34	5	6	7	40	5	31	6	32	5	6
11	C	5	26	6	37	5	33	11	32	5	28	6	35	5	34	8	15	5	30	6	33	5	34
12	M	5	25	6	38	sets.		morn.		5	26	6	36	sets.		8	53	5	28	6	34	sets.	
13	T	5	23	6	39	8	20	0	8	5	25	6	37	8	16	9	33	5	27	6	35	8	18
14	W	5	21	6	40	9	19	0	46	5	24	6	38	9	15	10	21	5	25	6	36	9	12
15	T	5	20	6	41	10	19	1	27	5	22	6	39	10	15	10	52	5	24	6	37	10	11
16	F	5	18	6	42	11	18	2	10	5	20	6	40	11	13	11	41	5	23	6	38	11	10
17	S	5	16	6	43	morn.		2	57	5	19	6	41	morn.	morn.			5	21	6	39	morn.	
18	C	5	15	6	45	0	14	3	49	5	17	6	42	0	10	0	35	5	20	6	40	0	5
19	M	5	13	6	46	1	7	4	47	5	16	6	43	1	3	1	36	5	18	6	41	0	58
20	T	5	12	6	47	1	55	5	53	5	14	6	44	1	51	2	39	5	17	6	42	1	47
21	W	5	10	6	48	2	39	7	2	5	13	6	45	2	36	3	47	5	16	6	42	2	32
22	T	5	9	6	49	3	18	8	9	5	11	6	46	3	16	4	52	5	14	6	43	3	14
23	F	5	7	6	50	3	54	9	8	5	10	6	47	3	53	5	54	5	13	6	44	3	52
24	S	5	6	6	51	4	29	10	2	5	8	6	48	4	29	6	48	5	11	6	45	4	28
25	C	5	4	6	52	rises.		10	54	5	7	6	49	rises.		7	38	5	10	6	46	rises.	
26	M	5	3	6	53	7	27	11	40	5	6	6	50	7	25	8	22	5	9	6	47	7	22
27	T	5	1	6	55	8	37	ev.	24	5	4	6	51	8	34	9	11	5	8	6	48	8	30
28	W	5	0	6	56	9	44	1	11	5	3	6	52	9	40	9	58	5	6	6	49	9	36
29	T	4	58	6	57	10	45	2	1	5	2	6	53	10	40	10	53	5	5	6	50	10	36
30	F	4	57	6	58	11	40	2	49	5	0	6	55	11	35	11	32	5	4	6	51	11	30

Cotswolds—imported by M. H. Cochrane, Montreal—Sept. 3, 1868. By B. Loomis, Windsor Locks, Ct.—Sept. 24, 1868. By J. D. Wing, New-York—Sept. 17, 1868.
 Cotton Culture, by J. B. Lyman—Jan. 16, 1868.
 Country Homes, by S. E. Todd—Sept. 3, 1868.
 Devons—American Herd Book, Vol. 2d—July 30, 1868.
 Dewey, Dr. Chester, Rochester. Obituary—Jan. 2, 1868.
 Dorkings—imported by J. R. Page, Sennett, Jan. 9, 1868.
 Dun, R. G. & J. G., London, Ohio. Sale of Short-Horns—May 14, 1868.
 Elements of Agriculture, by G. E. Waring—June 4, 1868.

MOON'S PHASES.		BOSTON.	NEW-YORK.	WASHINGTON	SUN ON MERID.	
	D.	H. M.	H. M.	H. M.	D.	H. M. S.
THIRD QUARTER	3	8 57 mo.	8 45 mo.	8 33 mo.	1	11 56 54
NEW MOON, . . .	11	11 23 mo.	11 11 mo.	10 59 mo.	9	11 56 14
FIRST QUARTER,	18	4 45 ev.	4 33 ev.	4 21 ev.	17	11 56 10
FULL MOON, . . .	25	10 39 mo.	10 27 mo.	10 15 mo.	25	11 56 41

DAY OF MONTH.	DAY OF WEEK.	CALENDAR				CALENDAR				CALENDAR			
		For Boston, New-England, New-York State, Michigan, Wisconsin, Iowa, and Oregon.				For New-York City, Philadelphia, Connecticut, N. Jersey, Penn., Ohio, Indiana and Illinois.				For Washington, Maryl'd, Virginia, Kent'ky, Miss'ri, and California.			
		SUN RISES	SUN SETS.	MOON RISES.	H. W. BOST'N	SUN RISES	SUN SETS.	MOON RISES.	H. W. N. Y.	SUN RISES	SUN SETS.	MOON RISES.	
1	S	4 56	7 0	morn.	3 39	4 59	6 56	morn.	ev. 25	5 2	6 52	morn.	
2	C	4 54	7 1	0 26	4 33	4 58	6 57	0 21	1 20	5 1	6 53	0 17	
3	M	4 53	7 2	1 7	5 28	4 56	6 58	1 3	2 14	5 0	6 54	0 59	
4	T	4 52	7 3	1 42	6 23	4 55	6 59	1 39	3 9	4 59	6 55	1 36	
5	W	4 51	7 4	2 13	7 17	4 54	7 0	2 11	4 2	4 58	6 56	2 8	
6	T	4 49	7 5	2 43	8 7	4 53	7 1	2 41	4 51	4 57	6 57	2 39	
7	F	4 48	7 6	3 10	8 54	4 52	7 2	3 9	5 40	4 55	6 58	3 8	
8	S	4 47	7 7	3 36	9 38	4 51	7 3	3 36	6 24	4 54	6 59	3 36	
9	C	4 46	7 8	4 3	10 20	4 49	7 4	4 4	7 6	4 53	7 0	4 5	
10	M	4 44	7 9	4 33	11 2	4 48	7 5	4 35	7 45	4 52	7 1	4 36	
11	T	4 43	7 10	sets.	11 42	4 47	7 6	sets.	8 24	4 51	7 2	sets.	
12	W	4 42	7 11	8 12	morn.	4 46	7 7	8 8	9 8	4 50	7 2	8 4	
13	T	4 41	7 12	9 12	0 22	4 45	7 8	9 8	9 53	4 49	7 3	9 4	
14	F	4 40	7 13	10 11	1 7	4 44	7 9	10 7	10 36	4 49	7 4	10 2	
15	S	4 39	7 14	11 6	1 55	4 43	7 10	11 2	11 26	4 48	7 5	10 57	
16	C	4 38	7 15	11 55	2 44	4 42	7 11	11 51	morn.	4 47	7 6	11 47	
17	M	4 37	7 16	morn.	3 36	4 41	7 12	morn.	0 22	4 46	7 7	morn.	
18	T	4 36	7 17	0 40	4 35	4 40	7 13	0 36	1 22	4 45	7 8	0 33	
19	W	4 35	7 18	1 19	5 38	4 39	7 14	1 16	2 24	4 44	7 9	1 14	
20	T	4 34	7 19	1 55	6 42	4 39	7 15	1 54	3 28	4 43	7 10	1 52	
21	F	4 33	7 20	2 29	7 45	4 38	7 16	2 28	4 29	4 43	7 10	2 28	
22	S	4 32	7 21	3 2	8 45	4 37	7 17	3 3	5 30	4 42	7 11	3 3	
23	C	4 31	7 22	3 35	9 39	4 36	7 18	3 37	6 25	4 41	7 12	3 38	
24	M	4 31	7 23	4 12	10 30	4 36	7 19	4 14	7 15	4 41	7 13	4 17	
25	T	4 30	7 24	rises.	11 20	4 35	7 20	rises.	8 1	4 40	7 14	rises.	
26	W	4 29	7 25	8 29	ev. 5	4 34	7 20	8 24	8 50	4 39	7 14	8 20	
27	T	4 29	7 26	9 28	0 51	4 34	7 21	9 23	9 37	4 39	7 15	9 18	
28	F	4 28	7 27	10 19	1 38	4 33	7 22	10 15	10 23	4 38	7 16	10 10	
29	S	4 27	7 28	11 3	2 25	4 32	7 23	10 59	11 8	4 38	7 17	10 55	
30	C	4 27	7 28	11 42	3 11	4 32	7 23	11 38	11 56	4 37	7 17	11 34	
31	M	4 26	7 29	morn.	3 58	4 31	7 24	morn.	ev. 44	4 37	7 18	morn	

Farming for Boys, by author of Ten Acres Enough—May 14, 1868.
 Farm Talk, by G. E. Brackett—June 25, 1868.
 Fitch, Thomas, New London, Ct. Public Sale of Ayrshires, &c.—July 23, 1868.
 Goodsell, N., New-Haven, N. Y. Obituary Notice—Feb. 13, 1868.
 Granger, Gideon, Canandaigua. Obituary Notice—Sept. 24, 1868.
 Grapes and Wine Making, by Geo. Husmann—Feb. 6, 1868.
 Grapes—Siedhof's Manual—Jan. 9, 1868.
 Grape Culture, by T. Hart Hyatt—Dec. 26, 1867.

MOON'S PHASES.		BOSTON.		NEW-YORK.	WASHINGTON	SUN ON MERID.	
	D.	H. M.	H. M.	H. M.	H. M.	D.	H. M. S.
THIRD QUARTER	2	2 37 mo.	2 25 mo.	2 13 mo.	2 13 mo.	1	11 57 34
NEW MOON, . . .	9	11 8 ev.	10 56 ev.	10 44 ev.	10 44 ev.	9	11 58 58
FIRST QUARTER,	16	9 31 ev.	9 19 ev.	9 7 ev.	9 7 ev.	17	12 0 38
FULL MOON, . . .	23	8 55 ev.	8 43 ev.	8 31 ev.	8 31 ev.	25	12 2 21

DAY OF MONTH.	DAY OF WEEK.	CALENDAR				CALENDAR				CALENDAR		
		For Boston, New-England, New-York State, Michigan, Wisconsin, Iowa, and Oregon.				For New-York City, Philadelphia, Connecticut, N. Jersey, Penn., Ohio, Indiana and Illinois.				For Washington, Maryl'd, Virginia, Kent'ky, Miss'ri, and California.		
		SUN RISES	SUN SETS.	MOON RISES.	H. W. BOST'N	SUN RISES	SUN SETS.	MOON RISES.	H. W. N. Y.	SUN RISES	SUN SETS.	MOON RISES.
1	T	4 25	7 30	0 15	4 47	4 31	7 24	0 12	1 33	4 36	7 19	0 9
2	W	4 25	7 30	0 45	5 39	4 30	7 25	0 43	2 25	4 36	7 19	0 41
3	T	4 25	7 31	1 12	6 28	4 30	7 26	1 10	3 14	4 36	7 20	1 9
4	F	4 24	7 32	1 39	7 20	4 30	7 26	1 38	4 5	4 35	7 21	1 38
5	S	4 24	7 32	2 4	8 9	4 29	7 27	2 5	4 54	4 35	7 21	2 5
6	C	4 24	7 33	2 33	8 58	4 29	7 28	2 35	5 44	4 35	7 22	2 36
7	M	4 23	7 33	3 3	9 46	4 29	7 28	3 6	6 32	4 34	7 23	3 8
8	T	4 23	7 34	3 38	10 32	4 29	7 29	3 41	7 17	4 34	7 23	3 44
9	W	4 23	7 35	4 17	11 19	4 28	7 30	4 21	8 0	4 34	7 24	4 25
10	T	4 23	7 36	sets.	morn.	4 28	7 30	sets.	8 49	4 34	7 24	sets.
11	F	4 22	7 36	9 0	0 4	4 28	7 31	8 55	9 37	4 34	7 25	8 40
12	S	4 22	7 37	9 53	0 51	4 28	7 31	9 48	10 24	4 34	7 25	9 44
13	C	4 22	7 37	10 40	1 40	4 28	7 32	10 36	11 15	4 34	7 26	10 32
14	M	4 22	7 38	11 21	2 32	4 28	7 32	11 18	morn.	4 34	7 26	11 15
15	T	4 22	7 38	11 59	3 24	4 28	7 32	11 57	0 9	4 34	7 26	11 55
16	W	4 22	7 38	morn.	4 19	4 28	7 33	morn.	1 6	4 34	7 27	morn.
17	T	4 22	7 39	0 32	5 16	4 28	7 33	0 31	2 2	4 34	7 27	0 30
18	F	4 22	7 39	1 5	6 18	4 28	7 33	1 5	3 4	4 34	7 28	1 5
19	S	4 22	7 39	1 38	7 20	4 28	7 34	1 39	4 5	4 34	7 28	1 41
20	C	4 23	7 40	2 10	8 20	4 29	7 34	2 12	5 4	4 34	7 28	2 15
21	M	4 23	7 40	2 47	9 16	4 29	7 34	2 50	6 2	4 34	7 28	2 53
22	T	4 23	7 40	3 27	10 9	4 29	7 34	3 31	6 55	4 35	7 28	3 35
23	W	4 23	7 40	rises.	11 0	4 29	7 34	rises.	7 43	4 35	7 29	rises.
24	T	4 23	7 40	8 10	11 47	4 29	7 35	8 5	8 30	4 35	7 29	8 0
25	F	4 24	7 41	8 58	ev. 31	4 30	7 35	8 54	9 18	4 35	7 29	8 49
26	S	4 24	7 41	9 39	1 16	4 30	7 35	9 35	10 2	4 36	7 29	9 31
27	C	4 24	7 41	10 15	1 59	4 30	7 35	10 12	10 41	4 36	7 29	10 8
28	M	4 25	7 40	10 47	2 41	4 31	7 35	10 44	11 23	4 37	7 29	10 42
29	T	4 25	7 40	11 14	3 23	4 31	7 35	11 12	ev. 8	4 37	7 29	11 11
30	W	4 26	7 40	11 40	4 5	4 31	7 35	11 39	0 52	4 37	7 29	11 39

Halsted, A. M., Rye, N. Y., imports Poultry—Nov. 21, 1868.
 Hayes, C. I., Unadilla, N. Y. Public Sale of Short-Horns—Nov. 7, 1867.
 Hill, J. M., Harristown, Ill. Public Sale of Short-Horns—Dec. 5, 1867.
 Horse Portraiture, by J. C. Simpson—Dec. 19, 1867.
 Horticultural Annual—O. Judd & Co.—Jan. 30, 1868.
 Illinois Industrial University inaugurated—March 19, 1868.
 Kennebec Co., Me. Boardman's Agricultural Survey—April 2, 1868.
 London White Potato introduced—July 30, 1868.
 Loomis, Burdett. Sale of Short-Horn Herd to Mr. Arms—May 28, 1868.

MOON'S PHASES.		BOSTON.	NEW-YORK.	WASHINGTON	SUN ON MERID.	
	D.	H. M.	H. M.	H. M.	D.	H. M. S.
THIRD QUARTER	1	8 2 ev.	7 50 ev.	7 38 ev.	1	12 3 34
NEW MOON, . . .	9	8 54 mo.	8 42 mo.	8 30 mo.	9	12 4 56
FIRST QUARTER,	16	2 3 mo.	1 51 mo.	1 40 mo.	17	12 5 51
FULL MOON, . . .	23	9 10 mo.	8 58 mo.	8 46 mo.	25	12 6 12
THIRD QUARTER	31	0 22 ev.	0 11 ev.	11 58 mo.		

DAY OF MONTH.	DAY OF WEEK.	CALENDAR				CALENDAR				CALENDAR		
		For Boston, New-England, New-York State, Michigan, Wisconsin, Iowa, and Oregon.				For New-York City, Philadelphia, Connecticut, N. Jersey, Penn., Ohio, Indiana and Illinois.				For Washington, Maryl'd, Virginia, Kent'ky, Miss'ri, and California.		
		SUN RISES	SUN SETS.	MOON RISES.	H. W. BOST'N	SUN RISES	SUN SETS.	MOON RISES.	H. W. N. Y.	SUN RISES	SUN SETS.	MOON RISES.
1	T	4 26	7 40	morn	4 49	4 32	7 35	morn.	1 38	4 38	7 29	morn.
2	F	4 26	7 40	0 7	5 41	4 32	7 35	0 7	2 27	4 38	7 29	0 7
3	S	4 27	7 40	0 34	6 30	4 33	7 34	0 35	3 16	4 39	7 29	0 36
4	C	4 28	7 40	1 3	7 24	4 33	7 34	1 5	4 9	4 39	7 28	1 7
5	M	4 29	7 39	1 35	8 20	4 34	7 34	1 38	5 4	4 40	7 28	1 41
6	T	4 29	7 39	2 16	9 13	4 35	7 34	2 19	5 59	4 41	7 28	2 23
7	W	4 30	7 39	2 53	10 6	4 35	7 33	2 57	6 52	4 41	7 28	3 1
8	T	4 30	7 38	3 43	10 59	4 36	7 33	3 47	7 42	4 42	7 27	3 52
9	F	4 31	7 38	sets.	11 49	4 37	7 33	sets.	8 32	4 42	7 27	sets.
10	S	4 32	7 38	8 34	morn.	4 37	7 32	8 30	9 23	4 43	7 27	8 25
11	C	4 33	7 37	9 20	0 37	4 38	7 32	9 16	10 12	4 44	7 26	9 13
12	M	4 33	7 37	9 59	1 28	4 39	7 31	9 57	11 0	4 44	7 26	9 54
13	T	4 34	7 36	10 35	2 18	4 39	7 31	10 34	11 51	4 45	7 26	10 32
14	W	4 35	7 36	11 7	3 6	4 40	7 30	11 7	morn.	4 46	7 25	11 7
15	T	4 36	7 35	11 40	3 57	4 41	7 30	11 41	0 43	4 46	7 24	11 42
16	F	4 37	7 34	morn.	4 53	4 42	7 29	morn	1 40	4 47	7 24	morn.
17	S	4 37	7 34	0 13	5 53	4 43	7 29	0 15	2 38	4 48	7 23	0 17
18	C	4 38	7 33	0 48	6 56	4 44	7 28	0 51	3 40	4 49	7 23	0 54
19	M	4 39	7 32	1 26	7 56	4 44	7 27	1 30	4 41	4 50	7 22	1 34
20	T	4 40	7 31	2 9	8 57	4 45	7 26	2 13	5 42	4 51	7 21	2 18
21	W	4 41	7 30	2 57	9 51	4 46	7 26	3 1	6 37	4 52	7 21	3 6
22	T	4 42	7 30	3 48	10 42	4 47	7 25	3 53	7 26	4 52	7 20	3 58
23	F	4 43	7 29	rises.	11 27	4 48	7 24	rises.	8 10	4 53	7 19	rises.
24	S	4 44	7 28	8 13	ev. 9	4 48	7 23	8 10	8 54	4 54	7 18	8 6
25	C	4 45	7 27	8 47	0 49	4 49	7 23	8 44	9 36	4 55	7 18	8 41
26	M	4 46	7 26	9 16	1 29	4 50	7 22	9 14	10 15	4 56	7 17	9 12
27	T	4 47	7 25	9 44	2 8	4 51	7 21	9 42	10 49	4 57	7 16	9 41
28	W	4 48	7 24	10 8	2 46	4 52	7 20	10 8	11 29	4 58	7 15	10 8
29	T	4 49	7 23	10 36	3 25	4 53	7 19	10 36	ev. 10	4 58	7 14	10 37
30	F	4 50	7 22	11 4	4 6	4 54	7 18	11 5	0 53	4 59	7 13	11 7
31	S	4 51	7 21	11 33	4 54	4 55	7 17	11 35	1 41	4 59	7 12	11 38

Lop-Eared Rabbits imported by John Haven, New-York—Nov. 28, 1867.
 Mammoth Cluster Raspberry introduced—Aug. 6, 1868.
 New-York Grape-Grower's Association, organized—Feb. 6 and March 5, 1868.
 Patrons of Husbandry organized—Feb. 27, 1868.
 Patent Right Sales—Law Passed in Ohio—July 9, 1868.
 Percheron Horse, by Chas. du Huys—July 16, 1868.

MOON'S PHASES.		BOSTON.	NEW-YORK.	WASHINGTON	SUN ON MERID.	
	D.	H. M.	H. M.	H. M.	D.	H. M. S.
NEW MOON, . . .	7	5 24 ev.	5 12 ev.	5 0 ev.	1	12 6 1
FIRST QUARTER,	14	7 57 mo.	7 45 mo.	7 33 mo.	9	12 5 12
FULL MOON, . . .	21	11 39 ev.	11 27 ev.	11 15 ev.	17	12 3 46
THIRD QUARTER	30	3 14 mo.	3 2 mo.	2 50 mo.	25	12 1 48

DAY OF MONTH.	DAY OF WEEK.	CALENDAR For Boston, New-England, New-York State, Michi- gan, Wisconsin, Iowa, and Oregon.				CALENDAR For New-York City, Phila- delphia, Connecticut, N. Jersey, Penn., Ohio, In- diana and Illinois.				CALENDAR For Washington, Maryl'd, Virginia, Kent'ky, Miss'ri, and California.			
		SUN RISES	SUN SETS.	MOON RISES.	H. W. BOST'N	SUN RISES	SUN SETS.	MOON RISES.	H. W. N. Y.	SUN RISES	SUN SETS.	MOON RISES.	
1	C	4 52	7 20	morn	5 46	4 56	7 16	morn.	2 32	5 0	7 11	morn.	
2	M	4 53	7 18	0 6	6 43	4 57	7 14	0 10	3 29	5 1	7 10	0 13	
3	T	4 54	7 17	0 44	7 43	4 58	7 13	0 48	4 28	5 2	7 9	0 52	
4	W	4 55	7 16	1 30	8 46	4 59	7 12	1 34	5 31	5 3	7 8	1 39	
5	T	4 56	7 15	2 23	9 45	5 0	7 11	2 28	6 31	5 4	7 7	2 33	
6	F	4 57	7 14	3 24	10 42	5 1	7 10	3 29	7 26	5 5	7 6	3 34	
7	S	4 58	7 12	4 31	11 32	5 2	7 9	4 36	8 16	5 6	7 5	4 40	
8	C	4 59	7 11	sets.	morn.	5 3	7 7	sets.	9 8	5 6	7 4	sets.	
9	M	5 0	7 10	8 32	0 22	5 4	7 6	8 30	9 57	5 7	7 2	8 28	
10	T	5 1	7 8	9 8	1 11	5 5	7 5	9 8	10 41	5 8	7 1	9 7	
11	W	5 2	7 7	9 42	1 59	5 6	7 4	9 42	11 29	5 9	7 0	9 43	
12	T	5 3	7 6	10 16	2 46	5 7	7 2	10 17	morn.	5 10	6 59	10 19	
13	F	5 4	7 4	10 50	3 35	5 8	7 1	10 52	0 21	5 11	6 58	10 55	
14	S	5 5	7 3	11 27	4 29	5 9	7 0	11 30	1 16	5 12	6 56	11 34	
15	C	5 6	7 1	morn	5 29	5 10	6 58	morn	2 15	5 13	6 54	morn.	
16	M	5 7	7 0	0 8	6 32	5 11	6 57	0 12	3 18	5 14	6 53	0 16	
17	T	5 8	6 58	0 53	7 36	5 12	6 55	0 58	4 21	5 15	6 52	1 3	
18	W	5 10	6 57	1 44	8 38	5 13	6 54	1 49	5 22	5 16	6 51	1 54	
19	T	5 11	6 55	2 38	9 32	5 14	6 53	2 43	6 18	5 17	6 50	2 47	
20	F	5 12	6 54	3 35	10 21	5 15	6 51	3 39	7 7	5 17	6 48	3 43	
21	S	5 13	6 52	rises.	11 6	5 16	6 50	rises.	7 47	5 18	6 47	rises.	
22	C	5 14	6 51	7 18	11 45	5 17	6 48	7 15	8 26	5 19	6 45	7 13	
23	M	5 15	6 49	7 47	ev. 20	5 17	6 47	7 45	9 6	5 20	6 44	7 44	
24	T	5 16	6 48	8 13	0 58	5 18	6 45	8 12	9 43	5 21	6 43	8 12	
25	W	5 17	6 46	8 39	1 34	5 19	6 44	8 39	10 19	5 22	6 41	8 40	
26	T	5 18	6 44	9 5	2 10	5 20	6 42	9 6	10 52	5 23	6 40	9 7	
27	F	5 19	6 43	9 33	2 49	5 21	6 41	9 35	11 31	5 24	6 38	9 37	
28	S	5 20	6 41	10 4	3 28	5 22	6 39	10 7	ev. 14	5 25	6 37	10 10	
29	C	5 21	6 39	10 40	4 15	5 23	6 37	10 44	1 2	5 26	6 35	10 48	
30	M	5 22	6 38	11 21	5 9	5 24	6 36	11 25	1 55	5 26	6 34	11 30	
31	T	5 23	6 36	morn.	6 9	5 25	6 34	morn.	2 55	5 27	6 32	morn.	

Philosophy of Housekeeping, by Mr. and Mrs. Lyman—Oct. 24, 1867.

Popular American Entomology, by Dr. A. S. Packard—July 2, 1868.

Plows—Awards at Great Utica Trial—Dec. 5, 1867.

Trial of Draught, &c., at Brattleboro, Vt., June 11, 1868.

Potato—Early Rose, its introduction, &c.—April 9, 1868.

Vanderveer Seedling introduced—March 26, 1868.

Poultry—Standard of Excellence in, by A. M. Halsted—March 12, 1868.

Pullen, Isaac, Hightstown, N. J. Obituary Notice—Feb. 27, 1868.

MOON'S PHASES.		BOSTON.	NEW-YORK.	WASHINGTON	SUN ON MERID.	
	D.	H. M.	H. M.	H. M.	D.	H. M. S.
NEW MOON, . . .	6	1 22 mo.	1 10 mo.	0 58 mo.	1	11 59 43
FIRST QUARTER,	12	4 39 ev.	4 27 ev.	4 15 ev.	9	11 57 5
FULL MOON, . . .	20	3 57 ev.	3 45 ev.	3 33 ev.	17	11 54 17
THIRD QUARTER	28	4 26 ev.	4 14 ev.	4 2 ev.	25	11 51 29

DAY OF MONTH.	DAY OF WEEK.	CALENDAR				CALENDAR				CALENDAR							
		For Boston, New-England, New-York State, Michigan, Wisconsin, Iowa, and Oregon.								For New-York City, Philadelphia, Connecticut, N. Jersey, Penn., Ohio, Indiana and Illinois.				For Washington, Maryl'd, Virginia, Kent'ky, Miss'ri, and California.			
		SUN RISES	SUN SETS.	MOON RISES.	H. W. BOST'N	SUN RISES	SUN SETS.	MOON RISES.	H. W. N. Y.	SUN RISES	SUN SETS.	MOON RISES.					
1	W	5 24	6 35	0 9	7 16	5 26	6 33	0 14	4 1	5 28	6 31	0 19					
2	T	5 26	6 33	1 4	8 20	5 27	6 31	1 9	5 5	5 29	6 29	1 14					
3	F	5 27	6 31	2 8	9 24	5 28	6 29	2 12	6 10	5 30	6 28	2 17					
4	S	5 28	6 29	3 17	10 22	5 29	6 28	3 21	7 8	5 31	6 26	3 24					
5	C	5 29	6 28	4 30	11 15	5 30	6 26	4 33	7 57	5 32	6 25	4 36					
6	M	5 30	6 26	sets.	morn	5 31	6 25	sets.	8 47	5 33	6 23	sets.					
7	T	5 31	6 24	7 37	0 2	5 32	6 23	7 37	9 35	5 34	6 22	7 37					
8	W	5 32	6 22	8 12	0 48	5 33	6 21	8 14	10 21	5 35	6 21	8 15					
9	T	5 33	6 21	8 48	1 37	5 34	6 20	8 50	11 7	5 35	6 20	8 53					
10	F	5 34	6 19	9 25	2 24	5 35	6 18	9 28	11 58	5 36	6 18	9 31					
11	S	5 35	6 17	10 5	3 13	5 36	6 16	10 9	morn.	5 37	6 17	10 13					
12	C	5 36	6 15	10 51	4 6	5 37	6 15	10 55	0 53	5 38	6 15	11 0					
13	M	5 37	6 14	11 39	5 6	5 38	6 13	11 44	1 53	5 39	6 14	11 49					
14	T	5 38	6 12	morn	6 9	5 39	6 11	morn.	2 55	5 40	6 12	morn.					
15	W	5 39	6 10	0 34	7 15	5 40	6 9	0 38	3 59	5 41	6 10	0 43					
16	T	5 40	6 8	1 30	8 13	5 41	6 8	1 34	4 57	5 42	6 9	1 39					
17	F	5 41	6 7	2 28	9 7	5 42	6 6	2 31	5 52	5 43	6 7	2 35					
18	S	5 43	6 5	3 28	9 54	5 43	6 4	3 31	6 40	5 44	6 6	3 34					
19	C	5 44	6 3	4 24	10 36	5 44	6 3	4 27	7 21	5 44	6 4	4 29					
20	M	5 45	6 1	rises.	11 15	5 45	6 1	rises.	7 57	5 45	6 2	rises.					
21	T	5 46	6 0	6 42	11 50	5 46	5 59	6 42	8 33	5 46	6 1	6 42					
22	W	5 47	5 58	7 8	ev. 25	5 47	5 58	7 9	9 11	5 47	5 59	7 9					
23	T	5 48	5 56	7 34	1 0	5 48	5 56	7 36	9 46	5 48	5 58	7 38					
24	F	5 49	5 54	8 5	1 37	5 49	5 54	8 8	10 22	5 49	5 56	8 10					
25	S	5 50	5 53	8 38	2 17	5 50	5 53	8 41	10 59	5 50	5 54	8 45					
26	C	5 51	5 51	9 16	2 58	5 51	5 52	9 20	11 43	5 51	5 53	9 24					
27	M	5 52	5 49	10 0	3 46	5 52	5 50	10 4	ev. 32	5 52	5 51	10 9					
28	T	5 53	5 47	10 51	4 40	5 53	5 48	10 56	1 27	5 53	5 50	11 0					
29	W	5 54	5 46	11 50	5 43	5 54	5 46	11 54	2 29	5 54	5 48	11 59					
30	T	5 56	5 44	morn.	6 51	5 54	5 44	morn.	3 37	5 55	5 46	morn.					

Prong Hoe invented by Reisig & Hexamer—March 15, 1868.
 Record of Horticulture, by A. S. Fuller—June 11, 1868.
 Requa, J. A., Brocton. Obituary Notice—April 9, 1868.
 Salmon Raising Successful in New-Hampshire—Dec. 19, 1867.
 Short-Horns—American Sold in England—Oct. 17, and Nov. 7, 1867.
 American Herd Book, Eighth Volume—Jan. 23, 1868.
 Canada Herd Book, First Volume—June 11, 1868.
 English Herd Book, Seventeenth Volume—April 9, 1868.
 Imported by M. H. Cochrane, Montreal—Sept. 3 and 24, 1868.

MOON'S PHASES.		BOSTON.	NEW-YORK.	WASHINGTON	SUN ON MERID.	
	D.	H. M.	H. M.	H. M.	D.	H. M. S.
NEW MOON, . . .	5	9 35 mo.	9 23 mo.	9 11 mo.	1	11 49 31
FIRST QUARTER,	12	5 18 mo.	5 6 mo.	4 54 mo.	9	11 47 11
FULL MOON, . . .	20	9 13 mo.	9 1 mo.	8 49 mo.	17	11 45 20
THIRD QUARTER	28	3 50 mo.	3 38 mo.	3 26 mo.	25	11 44 7

DAY OF MONTH.	DAY OF WEEK.	CALENDAR For Boston, New-England, New-York State, Michi- gan, Wisconsin, Iowa, and Oregon.				CALENDAR For New-York City, Phila- delphia, Connecticut, N. Jersey, Penn., Ohio, In- diana and Illinois.				CALENDAR For Washington, Maryl'd, Virginia, Kent'ky, Miss'ri, and California.			
		SUN RISES	SUN SETS.	MOON RISES.	H. W. BOST'N	SUN RISES	SUN SETS.	MOON RISES.	H. W. N. Y.	SUN RISES	SUN SETS.	MOON RISES.	
		H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	
1	F	5 57	5 42	0 54	7 58	5 56	5 43	0 58	4 42	5 55	5 43	1 3	
2	S	5 58	5 40	2 4	9 3	5 57	5 41	2 8	5 48	5 56	5 42	2 11	
3	C	5 59	5 39	3 17	9 59	5 58	5 39	3 20	6 45	5 57	5 40	3 22	
4	M	6 0	5 37	4 33	10 53	5 59	5 38	4 34	7 37	5 58	5 39	4 35	
5	T	6 1	5 35	sets.	11 40	6 0	5 36	sets.	8 22	5 59	5 37	sets.	
6	W	6 2	5 33	6 41	morn.	6 1	5 35	6 42	9 12	6 0	5 35	6 44	
7	T	6 3	5 32	7 16	0 27	6 2	5 33	7 19	10 0	6 1	5 34	7 22	
8	F	6 4	5 30	7 57	1 14	6 3	5 31	8 1	10 45	6 2	5 32	8 5	
9	S	6 6	5 28	8 42	2 3	6 4	5 30	8 47	11 36	6 3	5 31	8 52	
10	C	6 7	5 27	9 32	2 52	6 5	5 28	9 37	morn.	6 4	5 29	9 42	
11	M	6 8	5 25	10 25	3 46	6 7	5 27	10 30	0 32	6 5	5 28	10 35	
12	T	6 9	5 23	11 13	4 43	6 8	5 25	11 27	1 31	6 6	5 26	11 32	
13	W	6 10	5 22	morn	5 44	6 9	5 23	morn	2 30	6 7	5 25	morn.	
14	T	6 11	5 20	0 21	6 44	6 10	5 22	0 25	3 30	6 8	5 23	0 29	
15	F	6 13	5 19	1 19	7 41	6 11	5 20	1 22	4 26	6 9	5 22	1 26	
16	S	6 14	5 17	2 18	8 33	6 12	5 19	2 21	5 18	6 10	5 21	2 23	
17	C	6 15	5 15	3 16	9 1	6 13	5 17	3 18	6 5	6 11	5 19	3 19	
18	M	6 16	5 14	4 13	10 1	6 14	5 16	4 14	6 47	6 12	5 18	4 15	
19	T	6 17	5 12	5 11	10 42	6 15	5 14	5 11	7 26	6 13	5 16	5 11	
20	W	6 18	5 11	rises.	11 34	6 16	5 13	rises.	8 0	6 14	5 15	rises.	
21	T	6 20	5 9	6 7	11 55	6 18	5 12	6 10	8 38	6 15	5 14	6 12	
22	F	6 21	5 8	6 40	ev. 31	6 19	5 10	6 43	9 18	6 16	5 13	6 47	
23	S	6 22	5 6	7 15	1 11	6 20	5 9	7 19	9 57	6 18	5 11	7 23	
24	C	6 23	5 5	7 56	1 52	6 21	5 7	8 1	10 36	6 19	5 10	8 6	
25	M	6 24	5 3	8 46	2 37	6 22	5 6	8 50	11 19	6 20	5 9	8 55	
26	T	6 26	5 2	9 40	3 27	6 23	5 4	9 45	ev. 12	6 21	5 8	9 50	
27	W	6 27	5 1	10 40	4 23	6 24	5 3	10 45	1 9	6 22	5 6	10 49	
28	T	6 28	4 59	11 46	5 24	6 26	5 2	11 50	2 10	6 23	5 5	11 54	
29	F	6 29	4 57	morn.	6 28	6 27	5 1	morn.	3 14	6 24	5 4	morn.	
30	S	6 31	4 57	0 56	7 36	6 28	4 59	0 59	4 21	6 25	5 2	1 2	
31	C	6 32	4 55	2 9	8 38	6 29	4 58	2 11	5 23	6 26	5 1	2 13	

Short-Horns—Sales of 1867 in England—Jan. 9, 1868.

Sale of Geo. H. Brown's Herd—April 30, 1868.

Shade Trees Encouraged—Law of Wisconsin—May 28, 1868.

Sheep—Jurian Winne's Experiments in Feeding Leicesters and Merinos—April 30, 1868.

Sheep Husbandry in Missouri, by S. P. Boardman—March 19, 1868.

Silesian Merinos imported by W. Chamberlain—Jan. 2 and May 21, 1868.

Silk and Silk Manufactures, by E. C. Cowdin—June 4, 1868.

South-Downs—Sale of the Ellman Flock—Oct. 3, 1867.

MOON'S PHASES.		BOSTON.		NEW-YORK.		WASHINGTON		SUN ON MERID.	
	D.	H. M.		H. M.	H. M.	H. M.		D.	H. M. S.
NEW MOON, . . .	3	6 51 ev.		6 39 ev.		6 27 ev.		1	11 43 41
FIRST QUARTER,	10	10 11 ev.		9 59 ev.		9 47 ev.		9	11 44 0
FULL MOON, . . .	19	2 34 mo.		2 22 mo.		2 10 mo.		17	11 45 13
THIRD QUARTER	26	1 30 ev.		1 18 ev.		1 6 ev.		25	11 47 18

DAY OF MONTH.	DAY OF WEEK.	CALENDAR For Boston, New-England, New-York State, Michi- gan, Wisconsin, Iowa, and Oregon.				CALENDAR For New-York City, Phila- delphia, Connecticut, N. Jersey, Penn., Ohio, In- diana and Illinois.				CALENDAR For Washington, Maryl'd, Virginia, Kent'ky, Miss'ri, and California.													
		SUN RISES		SUN SETS.		MOON RISES.		H. W. BOST'N		SUN RISES		SUN SETS.		MOON RISES.									
		H	M	H	M	H	M	H	M	H	M	H	M	H	M	H	M						
1	M	6	33	4	54	3	21	9	34	6	30	4	57	3	21	6	20	6	27	5	0	3	22
2	T	6	34	4	53	4	35	10	27	6	31	4	56	4	35	7	12	6	28	4	59	4	34
3	W	6	36	4	51	5	50	11	17	6	32	4	54	5	49	7	59	6	29	4	58	5	47
4	T	6	37	4	50	sets.	morn			6	34	4	53	sets.		8	49	6	31	4	57	sets.	
5	F	6	38	4	49	6	31	0	4	6	35	4	52	6	35	9	38	6	32	4	56	6	40
6	S	6	39	4	48	7	19	0	52	6	36	4	51	7	23	10	24	6	33	4	55	7	28
7	C	6	41	4	47	8	13	1	41	6	37	4	50	8	18	11	15	6	34	4	54	8	23
8	M	6	42	4	45	9	7	2	32	6	38	4	49	9	12	morn.		6	35	4	53	9	17
9	T	6	43	4	44	10	9	3	24	6	40	4	48	10	13	0	9	6	36	4	52	10	18
10	W	6	44	4	43	11	9	4	16	6	41	4	47	11	13	1	3	6	37	4	51	11	16
11	T	6	46	4	42	morn.		5	11	6	42	4	46	morn.		1	57	6	38	4	50	morn.	
12	F	6	47	4	41	0	9	6	7	6	43	4	45	0	12	2	53	6	39	4	49	0	15
13	S	6	48	4	40	1	8	7	1	6	44	4	44	1	10	3	46	6	40	4	48	1	12
14	C	6	49	4	39	2	6	7	51	6	46	4	43	2	7	4	35	6	41	4	47	2	8
15	M	6	51	4	39	3	3	8	39	6	47	4	42	3	3	5	25	6	43	4	47	3	3
16	T	6	52	4	38	4	c	9	22	6	48	4	41	3	59	6	8	6	44	4	46	3	58
17	W	6	53	4	37	4	58	10	4	6	49	4	40	4	57	6	50	6	45	4	45	4	55
18	T	6	54	4	36	5	57	10	47	6	50	4	39	5	55	7	31	6	46	4	44	5	52
19	F	6	56	4	35	rises.		11	25	6	51	4	39	rises.		8	8	6	47	4	44	rises.	
20	S	6	57	4	34	5	55	ev.	6	6	53	4	38	6	0	8	51	6	48	4	43	6	4
21	C	6	58	4	34	6	32	0	48	6	54	4	38	6	36	9	34	6	49	4	43	6	41
22	M	6	59	4	33	7	34	1	34	6	55	4	37	7	39	10	19	6	50	4	42	7	44
23	T	7	0	4	32	8	30	2	32	6	56	4	36	8	34	11	4	6	51	4	42	8	40
24	W	7	2	4	32	9	37	3	12	6	57	4	36	9	41	11	57	6	52	4	41	9	45
25	T	7	3	4	31	10	44	4	5	6	58	4	35	10	47	ev.	52	6	53	4	40	10	50
26	F	7	4	4	31	11	52	5	4	6	59	4	35	11	54	1	51	6	55	4	40	11	56
27	S	7	5	4	30	morn.		6	6	7	0	4	35	morn.		2	52	6	56	4	40	morn.	
28	C	7	6	4	30	1	3	7	8	7	2	4	34	1	4	3	55	6	57	4	40	1	5
29	M	7	7	4	30	2	15	8	11	7	3	4	34	2	15	4	55	6	58	4	39	2	15
30	T	7	8	4	29	3	27	9	8	7	4	4	34	3	25	5	53	6	59	4	39	3	24

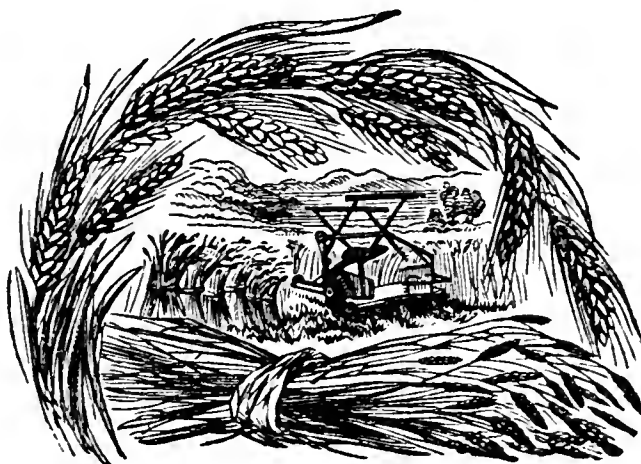
Sparrows imported from England at New-York—March 19, 1868.
 Spears, J. H., Tallula, Ill., Sale of Short-Horns—April 9, 1868.
 Stone, F. W., Guelph, Canada. Sale of Stock—Oct. 31, 1867.
 Storm Signals in Harvest Time—Plan of A. Watson—June 18, 1868.
 Stray Cattle—Law of New-York to Restrain—June 4, 1868.
 Steam Plows in Operation in Illinois and Louisiana—July 23, 1868.
 Suffolk Horses imported by M. H. Cochrane—Sept. 3, 1868.
 Table of Agricultural Exports from New-York for 1865, 1866 and 1867—Jan 9, 1868.
 Texas Cattle Fever Breaks out in Illinois—Aug. 13, 1868.

MOON'S PHASES.		BOSTON.		NEW-YORK.	WASHINGTON	SUN ON MERID.	
	D.	H. M.		H. M.	H. M.	D.	H. M. S.
NEW MOON, . . .	3	5 57 mo.		5 45 mo.	5 33 mo.	1	11 49 24
FIRST QUARTER,	10	6 27 ev.		6 15 ev.	6 3 ev.	9	11 52 46
FULL MOON, . . .	18	7 6 ev.		6 54 ev.	6 42 ev.	17	11 56 34
THIRD QUARTER	25	9 50 ev.		9 38 ev.	9 26 ev.	25	12 6 33

DAY OF MONTH.	DAY OF WEEK.	CALENDAR				CALENDAR				CALENDAR							
		For Boston, New-England, New-York State, Michigan, Wisconsin, Iowa, and Oregon.								For New-York City, Philadelphia, Connecticut, N. Jersey, Penn., Ohio, Indiana and Illinois.				For Washington, Maryl'd, Virginia, Kent'ky, Miss'ri, and California.			
		SUN RISES	SUN SETS.	MOON RISES.	H. W. BOST'N	SUN RISES	SUN SETS.	MOON RISES.	H. W. N. Y.	SUN RISES	SUN SETS.	MOON RISES.					
1	W	7 10	4 29	4 40	10 2	7 5	4 34	4 38	6 48	7 0	4 39	4 36					
2	T	7 11	4 29	5 54	10 55	7 6	4 33	5 51	7 39	7 1	4 39	5 47					
3	F	7 12	4 28	sets.	11 44	7 7	4 33	sets.	8 27	7 2	4 38	sets.					
4	S	7 13	4 28	5 55	morn.	7 8	4 33	6 0	9 20	7 2	4 38	6 5					
5	C	7 14	4 28	6 52	0 33	7 9	4 32	6 57	10 8	7 3	4 38	7 2					
6	M	7 15	4 28	7 52	1 22	7 10	4 32	7 57	10 52	7 4	4 38	8 2					
7	T	7 16	4 28	8 54	2 10	7 11	4 32	8 58	11 41	7 5	4 38	9 2					
8	W	7 17	4 28	9 55	2 57	7 12	4 32	9 59	morn.	7 6	4 38	10 2					
9	T	7 17	4 28	10 56	3 44	7 13	4 32	10 58	0 30	7 7	4 38	11 1					
10	F	7 18	4 28	11 54	4 33	7 14	4 32	11 56	1 20	7 8	4 38	11 57					
11	S	7 19	4 28	morn.	5 22	7 15	4 32	morn	2 7	7 9	4 38	morn.					
12	C	7 20	4 28	0 52	6 11	7 15	4 32	0 53	2 57	7 9	4 39	0 53					
13	M	7 21	4 28	1 50	7 2	7 16	4 33	1 49	3 47	7 10	4 39	1 49					
14	T	7 22	4 28	2 48	7 52	7 16	4 33	2 46	4 37	7 11	4 39	2 45					
15	W	7 22	4 29	3 46	8 41	7 17	4 33	3 44	5 26	7 12	4 39	3 41					
16	T	7 23	4 29	4 45	9 28	7 18	4 33	4 42	6 13	7 12	4 40	4 39					
17	F	7 24	4 29	5 45	10 14	7 18	4 33	5 41	7 0	7 13	4 40	5 37					
18	S	7 24	4 29	rises.	11 1	7 19	4 34	rises.	7 44	7 14	4 40	rises.					
19	C	7 25	4 30	5 27	11 45	7 20	4 34	5 32	8 29	7 14	4 41	5 37					
20	M	7 26	4 30	6 26	ev. 32	7 20	4 35	6 31	9 19	7 15	4 41	6 36					
21	T	7 26	4 31	7 29	1 20	7 21	4 35	7 33	10 6	7 15	4 42	7 38					
22	W	7 26	4 31	8 25	2 9	7 21	4 36	8 39	10 50	7 16	4 42	8 42					
23	T	7 27	4 32	9 45	2 57	7 22	4 37	9 47	11 41	7 16	4 43	9 50					
24	F	7 27	4 32	10 54	3 48	7 22	4 37	10 56	ev. 34	7 17	4 43	10 57					
25	S	7 28	4 33	morn.	4 42	7 23	4 38	morn.	1 29	7 17	4 44	morn.					
26	C	7 28	4 33	0 3	5 41	7 23	4 39	0 4	2 27	7 17	4 44	0 4					
27	M	7 28	4 34	1 13	6 42	7 23	4 39	1 12	3 28	7 18	4 45	1 11					
28	T	7 29	4 35	2 24	7 44	7 23	4 40	2 22	4 29	7 18	4 46	2 20					
29	W	7 29	4 36	3 35	8 46	7 24	4 40	3 32	5 31	7 18	4 47	3 29					
30	T	7 29	4 37	4 45	9 43	7 24	4 41	4 42	6 29	7 19	4 47	4 38					
31	F	7 30	4 37	6 3	10 37	7 24	4 42	5 59	7 22	7 19	4 48	5 54					

Trial of Plows at Amherst, Mass.—May 21, 1868.
 Trabue, A. E., Hannibal, Mo., Short-Horn herd established—Dec. 12, 1867.
 Variation in Plants and Animals, by Chas. Darwin—June 25 and July 9, 1868.
 Wheat Culturist, by S. E. Todd—March 5, 1868.
 Wisconsin Horticultural Garden established—March 26, 1868.
 Weeding Hoe, invented by E. M. Conkling, Parma, N. Y.—Aug. 27, 1868.
 Wools and Woolens exhibited at Chicago—Aug. 13, 1868.
 Young Farmer's Manual, by S. E. Todd—Dec. 19, 1867.

THE
ILLUSTRATED ANNUAL REGISTER
OF
RURAL AFFAIRS.



CULTURE OF WHEAT.

EVERY FARMER naturally asks himself the question—How can I secure the largest amount of this great leading grain crop? Answer—Examine and imitate the best practices and the modes of culture adopted by those who uniformly obtain the largest returns. There are a few successful managers who raise from fifty to one hundred per cent. more per acre, than the average crops of the country. It is well worth while to look into the secret of their success. If their practice could be imitated so as to add fifty per cent. to the four hundred million dollars worth of grain raised annually in the country at large, by an addition of two hundred millions more, it would be worth some little trouble to reach this desirable result. We propose to devote a few pages to an examination of these best practices.

The requisites for success naturally divide themselves under four heads:

1. A good and suitable soil.
2. The best varieties of wheat.
3. Preparing the soil, sowing and general management.
4. Avoiding diseases, insects and other disasters.

SOILS.—There are certain districts of the country widely known or cele-

brated as being excellent wheat regions ; and there are others where it is supposed wheat cannot be profitably grown. There is no question that the common belief that the wheat crop is not adapted to certain places, has been at least partly owing to bad management. When the country was new and the soil fresh and productive, good crops were obtained with little difficulty. General success led to carelessness ; grain was sown after grain, without regard to a proper rotation, and the soil became gradually exhausted, and filled with weeds. This pernicious course was much practiced in the best wheat regions of Western New-York, and the crops became so reduced that some went so far as to predict the entire failure of wheat raising. But by the adoption of underdraining, cleansing rotation, and enriching by clover, and a judicious application of manure, many have succeeded in obtaining a gradual increase in successive years, until the original amount yielded by the new, fresh and rich soil has been exceeded. Experiments of late years have proved that many portions of the early settled States, where the culture of wheat was long ago discontinued, will yield good and remunerative crops under proper management. It is a common opinion that the best wheat soils are those which contain a large portion of clay—commonly designated as *strong* soils. This is true to a great extent, but such soils nearly always require regular underdraining. It is

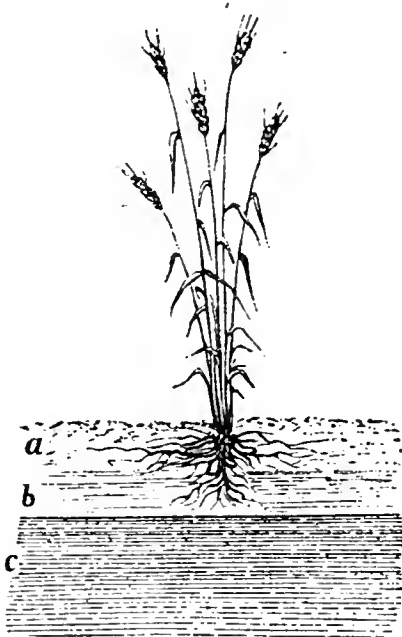


Fig. 2.—Wheat on Undrained Land, Growth Feeble—*a*, Top Soil, mostly Dry; *b*, Water Soaked Soil; *c*, Wet Subsoil.

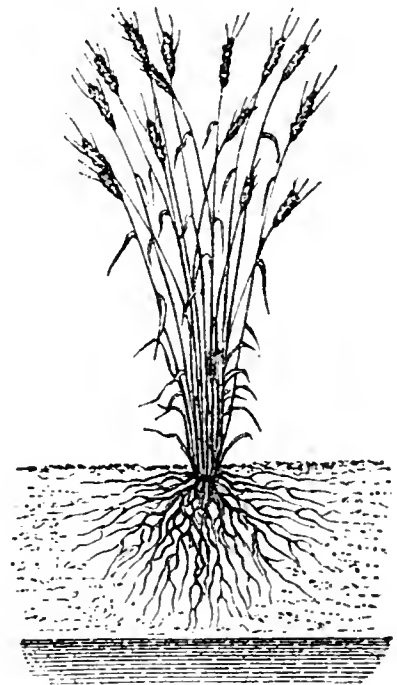


Fig. 3.—Wheat on Drained Land, of Strong Growth, the Water being Three Feet Down and below the Roots.

obvious where the whole field has to get rid of its surplus water by the slow process of soaking away through the particles from one side of the field to the other, or by the equally slow process of evaporation, a fatal loss of time must often result—all of which is obviated by providing

artificial means for a swift discharge in twenty-four hours of time, through regular channels of tile. Winter killing is obviated, manure is made accessible to the plant, and a deep mellow soil takes the place of the heavy, water-soaked or baked earth of the undrained farm. (Figs. 2 and 3.) Although light soils do not usually produce the heaviest yield of grain, yet the facility with which they are improved by rotation and clover, give them some advantages—so that, on the whole, more depends on good and proper management and adapting the system to the peculiarities of the soil.

Sometimes important advantages result from an intermixture of the subsoil with the surface. A farmer in Cayuga Co., N. Y., increased his wheat ten bushels more per acre, by running the plow two inches deeper than it had ever been before—thus throwing up and intermixing a small portion of

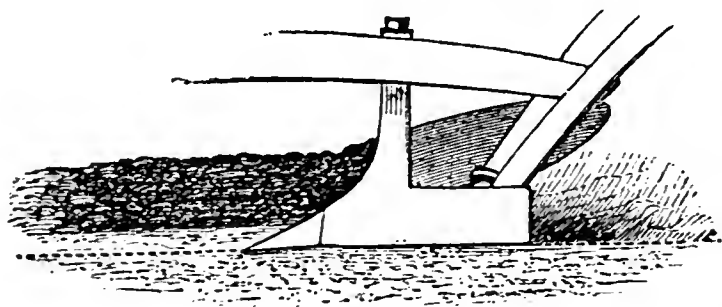


Fig. 4.—*Gradual Deepening of the Soil by Trench Plowing.*

the subsoil; fig. 4. A larger intermixture did not succeed so well until a few years' exposure to the air had changed its character. Another farmer, in Wayne Co., produced a like beneficial result by scattering the earth from a ditch over the adjacent land. Some years ago John Johnston of Geneva made the following statement of a striking result of a similar character: "A few years ago I had some 800 oak and black walnut stumps pulled; many of them brought up earth from four to six feet deep, and from ten to seventeen feet square on the surface. The first year after the stumps were pulled I put the field in wheat. Where the stumps stood the wheat was not so good as the other part of the field, but it is again in wheat now and I never saw any such wheat as is on the places where the stumps were pulled. You can see where every stump had been; the wheat is all of ten inches taller, stands far stockier on the ground, and looks as if a load of barnyard manure had been laid down and not half spread, and wheat sown on it; the straw is stiff and bright." This treatment will not be applicable to all soils, but only to such as experiment points out as having an enriching subsoil, when intermixed in moderate quantities.

VARIETIES.—Before the appearance of the wheat midge, the Soule wheat was one of the most popular and valuable sorts throughout a large portion of the Northern and Western States. The wide destruction produced by this insect led to the general introduction of the Mediterranean, which was found commonly to escape. This sort has now been cultivated many years, and from the success which has attended its crops, it has no doubt proved in the aggregate worth hundreds of millions to the country at large. The Blue Stem, a smooth, red variety, is an old, well known sort largely cultivated for the South. There is also a white variety by the same name, con-

siderably resembling the old white Flint. The straw having a bluish cast below the head has given it this name. The Lambert is a newer sort, more lately introduced, and much cultivated in portions of the West. It is a red chaff, bald wheat, of good but not of the highest quality, ripening a little earlier than the Mediterranean, and remarkable for its entire freedom from the attacks of the midge. The Early May has been a very popular sort at the Southwest; but although promising well for a time in some places, on its introduction into the North it has not generally succeeded, and has now nearly passed out of cultivation. It is a white bald variety, but not quite so white as the Soule. The Diehl wheat is a new sort not yet sufficiently tested to prove its standing, but recommended by some for its earliness, freedom from the midge, and general value. It is a bald, white wheat, with a short straw and short head. Some reports are unfavorable. There are two other new sorts which have been considerably raised in Central and Western New-York, and which in particular localities have given high promise of productiveness and value. These are the Wicks and the Treadwell. The Wicks wheat is a bearded variety, the beards more spreading than in the Mediterranean and the heads whiter in chaff and grain, which are rather long and slender. The Treadwell is a partly bald wheat, is not so white as the Wicks, but appears to be more uniformly productive, and has a firm, erect straw—the Wicks in some localities not succeeding so well as the old Mediterranean, but proving much superior to it in others.

There are in all hundreds of named varieties of American and foreign origin which have been more or less tested in this country, most of which have proved of no value, and very few equal to the sorts already mentioned. As the crop is yearly reproduced from seed there is a constant tendency to a change of character, and hence the importance of continually selecting the best for sowing. There are various modes of making the selection. A good one is to pass through the field just before cutting and select the largest, best and ripest heads; sow the grain from these, and repeat the process annually. Another is to provide a special screen for the fanning mill, which shall allow all the grain to pass through except the largest and plumpest. Another mode is to throw the wheat by handfuls across the barn floor—the largest grains will be thrown the farthest, and thus separated from the rest.

It is equally important to clean out foul seed. The late improvements in the fanning mill are such as to accomplish this result without much difficulty. Some farmers clean out the chaff and some other seeds by floating them on brine made just strong enough to effect the purpose and allow the wheat to sink—pouring off the floating matter and allowing the wheat to remain. The brine, which should be strong enough to float a potato, may be used several times. It is an old practice, successful to a considerable extent, to blow out the light seed, whether of weeds or the shriveled wheat grains, by removing the shaking rod from a fanning mill, so that the fan may be driven with greater velocity, taking out the unnecessary sieves, but allowing the lower one or screen to remain. One person turns

the fan rapidly while another regulates the discharge at the hopper. All the lighter stuff is blown out behind, and small, heavy seeds, like those of cockle, drop through the screen into the box below. Confining the blast from the fan by means of a large square board box or tube, assists in performing the operation with greater ease and efficiency.

PREPARATION OF THE SOIL---ROTATION.

For the purpose of bringing the soil up to a proper condition, and maintaining it in a fertile state, and free from weeds, nothing is more important than a well-planned rotation, including at least one hoed crop. The following courses have been adopted in the best wheat districts of Western New-York :

COURSE FOR A STRONG FERTILE SOIL.

- 1st year, Corn on clover sod.
- 2d do. Oats or barley.
- 3d do. Wheat.
- 4th do. Clover, mowed and cropped for seed.

This, it will be seen, is a four-course system, and is adapted to farming where raising crops is the principal object, and where there is a portion of permanent pasture on moist land. If the whole farm is well drained, a five year rotation may be adopted by seeding to both timothy and clover after the wheat, and by one year of pasturage after the mowing. It is important that the corn be kept well cultivated and perfectly clean. This will serve to eradicate such weeds as obtain a foothold in fields kept several years in grass, or in grass and sowed crops alternately. It is also important that one good crop of clover be plowed in during the course, in order to maintain fertility. The manure may be applied to the corn or the wheat, according to circumstances. If for the corn, the best way is to draw it out in winter as fast as it is made, and spread it broadcast and evenly at once. Much of it will soak into the soil, and it will be worth nearly twice as much as if kept till spring and applied just before planting. Such of the manure as may be too coarse, should be kept in heaps and turned over once or twice during summer, to be applied as a top-dressing after the land is plowed and before the wheat is sown. This application not only increases the wheat several bushels per acre in most instances, but it assists the catch of the clover seed, and pushes the young clover plants forward. If the soil is very rich, this top-dressing may promote the growth of too much straw ; but such cases are much rarer than the opposite difficulty.

On soils not quite so strong as the preceding, or where it is desirable to increase the fertility, the following course would be better :

- 1st year—Corn on sod.
- 2d year—Barley, followed by clover not cut nor pastured.
- 3d year—Clover plowed under when full grown, the sod rolled flat, pulverized with a two-horse cultivator, and sown with wheat.

4th year—Wheat.

5th year—Clover meadow.

6th year—Pasture.

It will be seen that only two tillage crops are allowed in succession, and that two green crops are plowed under during the course. This system allows the feeding of a considerable number of animals and the consequent manufacture of manure—the application of which to the corn or to the wheat, as may be required, in addition to the green crops, will maintain almost any soil in a condition for raising good crops of wheat.

It was formerly a practice in some of the best wheat districts to take off a crop of wheat and plow under a crop of clover every alternate year—thus forming a two-course system, with an enriching crop every second year. This appeared to do well for a time, but as there was no hoed crop, the ground often became infested with foul weeds, and a greater variety was found better, not only for the land, but for the purposes of a general mixed husbandry. It is a common opinion that oats after corn, and preceding the wheat, is more exhausting to the soil, and less favorable to the wheat, than barley; but some successful managers think this difference is entirely owing to the profusion of young plants which spring up from the oats scattered at harvesting. These crowd the wheat like weeds, and diminish its vigor until the oats are winter killed. Different expedients are therefore resorted to, to prevent this autumn growth. One is to turn in a large herd of swine as soon as the crop of oats is removed. Another, applicable only to moist seasons, is to harrow well the whole surface, so as to cause the oats to germinate before plowing under for the wheat. The harrowing will render the plowing more complete and perfect by the pulverization thus effected. A third method is to plow under the scattered oats with very shallow furrows, and after they have come up, to turn the whole under by deeper plowing preparatory to sowing the wheat. A fourth, and perhaps the best of all, is to plow first the whole field of oats stubble by what is termed the cut-and-cover process—the furrows being twenty inches or two feet apart, throwing out enough earth to cover the unmoved strip of ground a foot or more in width on the right hand of the plow. A good two-horse team will plow in this manner several acres a day. The whole is then harrowed, and unless the soil is extremely dry, the scattered seed will nearly all come up in a few days. It is then plowed under and the wheat sown. Where this course has been adopted, no perceptible difference has been seen between wheat after oats and after barley, the two growing side by side.

SUMMER FALLOWING.—This practice is unnecessary in the rotation already described, if the soil is clean and in good condition—in which case a summer crop of barley, oats, spring wheat or peas may occupy the ground that would otherwise be idle. But if the land contains many weeds, or is hard and requires thorough pulverization, summer fallowing, with two or three good plowings, and twice or thrice as many harrowings, produces an excellent effect. Under this treatment the earlier the manure can be applied,

the more thoroughly it will become intermixed. Experiment has been made by applying it on the sod in spring, turning it under at the last plowing before sowing, top-dressing after plowing but before seeding, and top-dressing early in winter when the ground is frozen. The spring application produced the best results.

MANURES.—The wheat crop needs a large supply of nitrogen, and such manures, therefore, as contain ammonia largely are the best. Stable manure, from animals fed on grain, or yard manure from cattle fed on clover or oil-cake, prove very efficient applications and much better than manure from straw fed animals only. The use of unadulterated Peruvian guano has greatly increased the amount of grain in some districts; but whether it would prove generally profitable under existing prices can be only determined by experiment and weighing and measuring. The application of a few bushels of salt per acre, although varying in its results, has generally proved beneficial by increasing the amount a few bushels. On some soils it has had no visible effect.

MANURING THE SURFACE.—There are very few soils where the crop is not greatly benefited by top-dressing with manure after plowing, and before the wheat is sown. The amount required for this purpose need not be so great as the usual application in manuring. It should, however, vary with the previous richness of the soil. If already quite rich, a thin dressing, just sufficient to give the young clover a good start, will be enough. On poorer soils, ten or twenty two-horse loads will not be too much. It should be evenly or uniformly spread, and for this reason old or fine manure is commonly preferred. Long or fresh manure will answer an excellent purpose if it has been forked over and well broken up, and it has the additional advantage of protecting the surface of the earth from the winds of winter by its straw or coarse fibre. A common practice in some places is to draw out the coarse spring manure, which is largely filled with straw or cornstalks, and deposit it in large heaps as near the intended place of application as practicable. Here it undergoes a necessary rotting down, and if there is much straw, the outsides of the heaps should be cut down with a hay knife and thrown together on top. While the last plowing for the wheat is going on, this manure is drawn in successive portions on to the newly plowed land—thus preventing the treading and hardening of the surface by teams, if left till the whole field were plowed.

PREPARING OLD SOD.—In the eastern portions of the United States, where the land is hardly rich enough for the course already described, good crops of wheat have been raised by planting on the inverted sod of old pastures. It is performed in the following manner: The sod is first turned over evenly and uniformly to a good depth. Of course, fields must be chosen that are clear of stumps and large stones. The furrow slices should be laid flat and not lap. A roller is then passed over the whole, and the inverted surface made mellow by the use of a two-horse wheel cultivator. Shares' harrow would probably accomplish the same end more perfectly.

There may be conditions of the soil that would obviate the necessity of rolling—such, for example, as a heavy or clayey nature and a moist situation. If the succeeding summer should happen to be quite wet, the omission of rolling would afford partial underdrainage, but it would be better not to sow at all on land inclining to be wet, or which would not bear thorough rolling. As soon as the rolling is completed, top-dress the whole surface with fifteen or twenty loads of manure, and spread it evenly and perfectly. If the soil is rather light in character, it is important that this top-dressing be applied before the cultivating is given. If on the other hand it is quite strong or clayey, it will be as well to apply at least a part of it after the surface is pulverized, or even after the sowing of the seed, as it will thus protect the surface and tend to keep it from crusting. Rolling the whole just before sowing, if the drill is used, enables the operator to deposit the seed at a more uniform depth than on a rough and uneven surface; the practice also leaves uniform furrows at each drill, thus afford-



Fig. 5.—Section of Drills Showing the Furrows.

ing protection to the young plants in cold weather by their being below the sweep of winds. For the same reason these furrows should be across the direction of prevailing blasts, if the field happens to be in a windy situation. The crumbling of frost and the rolling or harrowing of the field early in spring, fill up these small hollows with fresh earth, which benefits the plants.

DEPTH OF SOWING.—In a light loose soil the depth may be greater than in one more heavy and compact. A greater depth is required during a time of severe drouth than when the soil has a good supply of moisture. As a general average, a depth of two inches is enough. One inch would be better if the soil were sufficiently moist; but it is difficult to get a drill so as to deposit the seed uniformly so shallow. Some years ago the writer of this article performed a number of experiments with the following results—the depth being carefully measured, and the soil laid on the seed wheat in an even stratum:

Planted $\frac{1}{2}$ inch deep, the plants came up in 5 days.					
do.	1	do.	do.	do.	6 do.
do.	2	do.	do.	do.	7 do.
do.	3	do.	do.	do.	8 do.
do.	4	do.	do.	do.	10 do.
do.	6	do.	do.	do.	12 do.

Five weeks afterwards there was no perceptible difference in that planted half an inch and an inch deep; that planted two inches deep was not quite so good, so on decreasing in quality as the depth of planting increased. At six inches there were but very few slender stalks. As the crop approaches maturity the difference between the shallow and deep planting becomes less obvious—so that one inch and three inch planting are not greatly different in their results, although the deeper planting is a little later in ripening, and is hardly so productive. For this reason wheat planted with a good drill on well prepared and rolled ground, where it

may be put in with great evenness, ripens more uniformly, and brings a rather better return than wheat sown broadcast and covered with a harrow at all different depths. For the same reason twenty-five per cent. in seed is saved by using the drill. That is, a bushel and a half per acre will

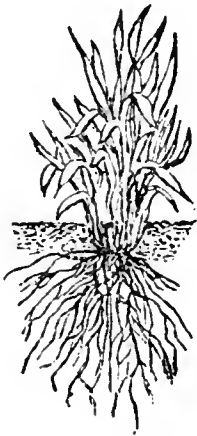


Fig. 6.—*Strong Growth of Young Stool Sown Shallow.*

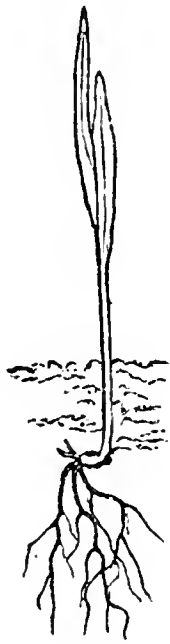


Fig. 7.—*Young Wheat Plant from Shallow Sowing, with Strong Roots.*

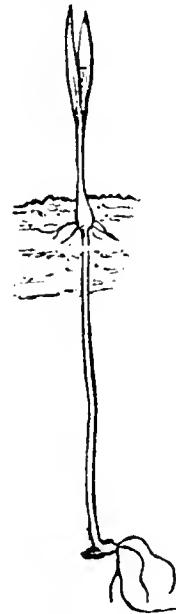


Fig. 8.—*Young Wheat Plant from Deep Sowing, with Feeble Roots Below and Striking New Roots near the Surface.*

answer the same purpose, if properly drilled in, as two bushels sown broadcast and harrowed. Before the introduction of the wheat drill the practice had been adopted by some farmers of plowing in wheat. This succeeded well on light, porous or gravelly soils, with plowing so shallow as not to cover much more than three inches deep, but the practice

was inapplicable to heavy and compact soils. Covering with a gang plow was also in successful use, but the process was much slower than with a drill, besides requiring sowing the seed previously by hand. The drill is so much more expeditious, and does the work so much better, that it is universally adopted in the best wheat growing districts—where one may drive all day without discovering a single field of broadcast sown grain.

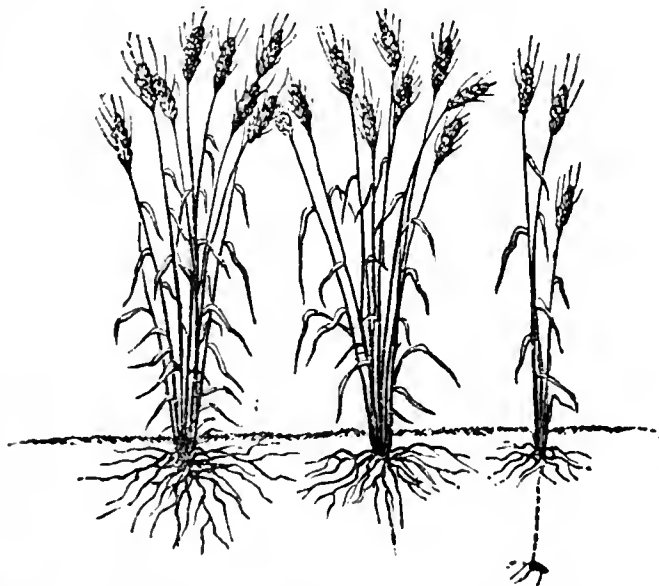


Fig. 9.—*Subsequent Effect of Deep and Shallow Planting.*

HARROWING IN SPRING.—The practice of harrowing the whole surface of the field early in spring, although adopted by some farmers many years ago, has not come into general use, and yet it has always been attended with good results, provided the ground was sufficiently dry at the time and a light, fine tooth harrow was used for the purpose. Although the young plants of the wheat appear to be rather roughly treated, yet scarcely any are ever torn out or seriously injured. The breaking of the crust, mellowing the whole surface, and the destruction of small weeds, all of which are well known to be beneficial in all hoed crops, cannot fail to assist the growth of wheat. It also prepares the ground for the reception of grass seed, which may be rolled in, and will be more likely to take than on a hard crust.

WINTER-KILLING.—On some soils and in some localities the destruction of the crop by freezing out, is a formidable drawback to the culture of this crop. Heavy, wet or undrained lands are most liable. Nothing is better by way of prevention, therefore, than thorough underdraining. It has not only doubled or tripled the crop in many instances, but has effected an insurance against this disaster. Sometimes winter-killing occurs on dry land much exposed to sharp wind, and when little snow has fallen. Top-dressing with manure at the time of sowing, or on the first freezing of the soil in winter, has proved valuable. Even a thin coat of straw, just sufficient to break the force of cold winds, has had an excellent effect. An experiment occurred under the eye of the writer, where a portion of a field sown with Mediterranean wheat, (which is more liable to be injured in this way than some other sorts,) received a thin dressing of straw, the other part remaining exposed. Winter-killing was unusually severe that year, and the whole of the exposed portion was so fatally injured as to be not worth cutting, while the other part yielded about twenty bushels per acre.

Where heavy or wet land has not been underdrained, some protection is afforded by plowing the ground into narrow "lands" or ridges eight or ten feet wide, and so laid that the dead furrows between them shall make the shortest discharge in the direction of the descent. This, however, is but a partial remedy—as well as another practice of turning over such land when in sod, partly lapping the furrows running in a similar direction down hill, so as to drain off the water from the inverted sod above.

TIME FOR HARVESTING.—A general practice is to cut wheat too late, or when it is dead ripe, with the heads bent over and hanging downward. A better time is five or six days earlier, or before the heads droop much, or while the grain is in the dough state and the tips of the chaff are yet green. Careful experiments, in connection with accurate weighing, performed by the writer, proved that wheat cut thus early was slightly heavier than when cut later, and millers stated that it made more and better flour for a given weight. The straw, if well dried, is better, brighter and more valuable for feeding. It is true the straw is somewhat heavier, requires a little more labor and tight binding on account of shrinkage in drying; but

these are overbalanced by the less amount of waste in the harvest field. Since the introduction of reapers the time is more completely at the control of the farmer, and the crop should be secured at least two or three days before the usual dead ripe period.

In regions where showers are frequent, it will be found most economical to insure a perfect condition of the grain by placing it in water-proof shocks as soon as cut. There are two modes of making shocks—in a small round shape, and larger and oblong. The smaller ones are made by placing six sheaves firmly on the ground, with the tops drawn closely and compactly together. A seventh is then bound very tightly near the butts and the straw broken down all around before placing it in an inverted position on the top of the shock. The straw of the cap is then spread evenly all around, and pressed against the tops of the sheaves within—forming a perfect covering against any rain, however heavy or long continued. The oblong shocks are made by placing ten sheaves in a double row, the opposite ones against each other. Two caps are then put upon each shock. A good farmer and careful observer stated that in harvesting a large field, he placed a part of his wheat in these capped shocks and another part in double rows exposed to the weather. A rain of several days continuance followed, and all the exposed grain was nearly ruined by sprouting, while the capped portion came out as bright and as fresh as if the skies had remained cloudless through the whole.

At the time of threshing, care should be taken to secure the straw well from the rain, that when used, either for litter or for feeding, it may come out bright, fresh and uninjured.

SPRING WHEAT.

Spring wheat has occasionally proved a successful crop, but has not been largely cultivated for a great length of time in any district of country. As the flour does not bear distant shipping so well as winter wheat, it is more particularly adapted to home consumption. It may sometimes be sown with advantage when circumstances have not permitted the sowing of a winter crop the previous autumn. A good clover sod turned under in autumn and thoroughly mellowed, by means of a horse cultivator, in spring, is a good preparation; it also succeeds well on well pulverized soil after corn. A medium loam is found best; very light or very heavy clayey land not succeeding so well. The practices of sowing very early, so as to escape the midge, or quite late, so that it may ripen after the midge is passed, have both been adopted, but the early sowing has commonly done best. The most popular varieties have been the Fife, Club and China Tea. The China Tea has been the favorite variety in Western New-York. It has a white chaff bearded head, which is long, the kernels not very close together, with a large grain. The Canada Club is an early sort, but is not nearly so tall as the China Tea. The heads are rather close and compact. The Fife is rather taller than the Club, but not so much so as the

China Tea. It succeeds better on lowlands than other varieties. The straw is strong and stiff, and seldom lodges.

DISEASES AND ENEMIES.

These may be classed under four different heads, namely—1. Winter-killing. 2. Smut. 3. Rust. 4. Insects, including the Hessian fly and the midge—the chinch bug and some other insects have proved destructive in certain localities.

Remedies for winter-killing have been already pointed out; but it may be well to speak briefly of a pernicious weed which almost invariably springs up on winter-killed patches. This is chess, or cheat—*Bromus secalinus* of botanists. It is a very hardy plant, growing from a small hardy seed. The plant when shaded by wheat is often only a few inches high, bearing a few seed, and entirely unobserved by the farmer. But when the wheat is destroyed, the chess has all the space, and each plant springs up several feet high, bearing thousands of seeds. Plants have been found in shaded places only two inches high and reproducing seed; and again, when entirely unshaded, from three to five thousand grains have been counted on a single root. Nothing is therefore more natural than for careless and superficial cultivators to come to the conclusion that the wheat, being partly killed, has changed to chess. But as the two plants belong to different genera, such a change is impossible. The seeds of chess, on account of their small size and hardness, are often scattered in the soil in manure, foul seed, droppings of animals, from itinerant threshing machines, and in various other ways unperceived; but farmers who have taken special pains always to sow perfectly clean seed, have succeeded in a few years in eradicating the chess plant entirely from their farms.

2. SMUT.—This is a fungus which takes possession of the grain and reduces it to a black powder. The microscopic seeds of this fungus plant become attached to the seed grain in large numbers, and ascend through the sap vessels of the growing plant, producing smut in the new heads. It is easily prevented by washing the seed wheat. If there is much smut, the wheat should be first washed in water, which may be done in tubs by stirring the water and wheat together, pouring off the blackened liquid and adding fresh portions until it runs clear. Then wash in brine, spread on a barn floor, and dust with dry, powdered, water-slaked lime, stirring the whole together. If this seed is now sown, no smut will be reproduced from it. If the seed wheat is but slightly infested, the washing with water will not be necessary. A solution of blue vitriol has been found very efficient in destroying smut; but in ordinary instances, brine answers the purpose. Smut is often carried from one farm to another by means of itinerant threshing machines.

3. RUST—When slight, does little injury, but in its more severe or extensive attacks it covers both surfaces of the leaves, the stubble, straw and chaff, first imparting a yellowish, then a brown, and afterwards nearly a

black appearance. It is a small, microscopic plant or fungus, the seeds of which are distributed through the sap pores. These seeds produce

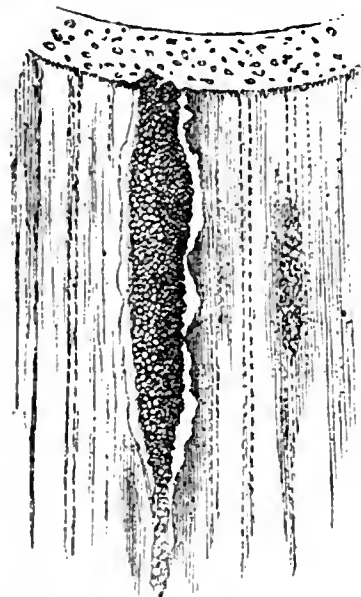


Fig. 10.—Magnified View of Rust Plants, bursting open the Skin of the Straw—also Plants beneath Skin Unburst.

young plants under the epidermis or skin of the wheat—which they swell and burst in longitudinal slits all over the plant. These little plants may be distinctly seen by means of a powerful microscope, in all stages of their development—from the numerous little round regular heads, seen beneath the transparent and unbroken epidermis, to the confused mass after they have broken through and scattered their fine



Fig. 11.—Magnified Wheat Straw marked with Rust.

powder over the whole surface. In favorable weather, and in good wheat fields, rust makes but little progress, and does little or no harm; but when the weather suddenly becomes hot and moist, its attacks are often fatal to the crop. The growth of the grain is at once arrested, and if the crop is struck before the grain has formed, it will not be worth cutting. If partly formed it will be more or less injured. Wheat growing on low, wet and mucky soil is generally more liable to rust than on hard upland, but cases not unfrequently occur when it appears in belts or streaks, in the direction of prevailing winds, blighting alike every field of wheat, whether high or low, in its track. The remedy for rust is sowing on dry or well drained soil, which is rich enough to push the crop on and cause it to ripen early, beyond the reach of its attacks. Early ripening varieties are best on this account.

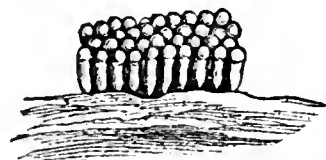


Fig. 12.—Magnified Rust Plants attached to the Straw.

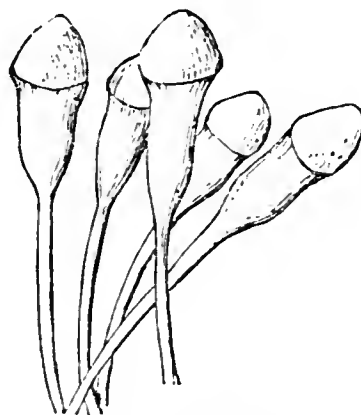


Fig. 13.—Highly Magnified Rust Plants.

INSECTS.

THE MIDGE—In the perfect insect state, is a small two-winged fly, somewhat resembling a musquito, about one-third its size, and of a bright yellow color. Early in summer it lays its eggs between the chaff of the newly formed

heads of wheat. The eggs hatch and produce small bright orange yellow worms or larvæ, which, when fully grown, in three or four weeks, are scarcely the tenth of an inch long. These minute insects, by their ravages have occasioned in the whole country a loss of hundreds of millions—more than the combined cost of the Union Pacific and Central Pacific Railroads.

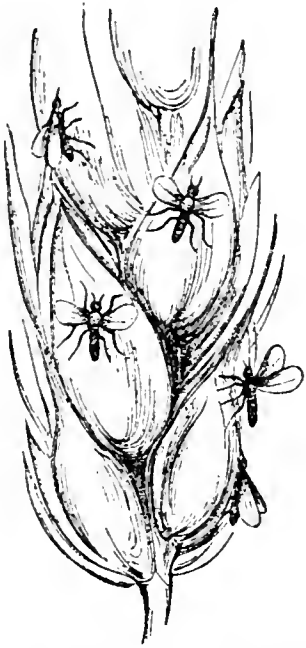


Fig. 14—Magnified Portion of Wheat Head, infested by the Magnified Midge depositing Eggs.

The destruction is usually the greatest in moist seasons, as the flies only lay their eggs in a moist air, and cannot endure a dry one; hence they are found at work chiefly in the night and on cloudy days. When the worms get their growth, they crawl down the straw when it is wet with rains, and form minute cocoons just beneath the surface, from which they emerge the next season in the fly state for reproduction. Many of the worms have not left the heads when the wheat is drawn in, and the straw continuing dry, they remain until threshed out with the grain, from which they are separated in the fanning mill, and in this state are well known to farmers, sometimes whole bushels being thus obtained in the screenings. They should either be burned or fed under shelter to pigs or poultry; if thrown out, they will produce new swarms of flies.

The best remedies for the ravages of the midge are the selection of such varieties of the wheat as are least affected by it—for example, the Mediterranean—and such good culture and management generally, as will bring early and heavy crops. A badly drained field, unmanured and imperfectly cultivated, has in some cases been nearly or entirely destroyed by the midge; while another field alongside, well managed in every respect, has nearly escaped and yielded a heavy crop. If the lesson which this insect teaches—namely, that the best cultivation only is attended with success—could be learned and adopted by every farmer, it would prove a real blessing instead of a disaster.

HESSIAN FLY.—This insect (*Cecidomyia destructor*), as well as the midge (*Cecidomyia Tritici*), was imported from Europe, where both have proved more or less injurious to wheat. The perfect insect considerably resembles a common musquito, but is a little smaller. It appears early in autumn, lays its minute reddish eggs on the upper sides of the leaves, where they hatch, and the minute worms crawl down the sheaves until they reach the bottom of the pocket formed by the union of the sheath and straw. Here they suck the juices and injure its growth, often causing it to wither and die. In about six weeks, it changes color, much resembling at this time a small flax seed. The following spring it passes to the pupa state, and afterwards to the perfect fly, making its second or spring attack on the crop. The injuries of this insect are shown by the broken and half prostrate straws scattered through the wheat field before harvest.

The Hessian fly has been eluded by sowing the grain so late as to be beyond the reach of the autumn insects—although this lateness has proved detrimental by inducing liability to winter-killing and rust.

The best remedy, generally speaking, like that for the midge, is the production of strong, heavy, early crops by good general management. It is said that this fly proved a positive blessing many years ago on Long Island, by actually compelling a better system of farming in place of the superficial and slipshod practices which had too commonly prevailed, and which resulted in the utter failure of wheat when the fly made its appearance.

THE CHINCH BUG is a small insect, about the third of an inch long, with a dark brown or black body and white wings, belonging to the bed-bug order and odor, and often proving very destructive to wheat crops at the South and West—more particularly to spring wheat. Unlike the midge, they are most abundant and destructive in dry seasons, and are repelled or destroyed by wet.

THE JOINT WORM much resembles the Hessian fly in its mode of attack, but differs by occupying the substance of the sheath, straw or joint, producing hardened vegetable tumors—instead of merely resting between the sheath and straw, like the Hessian fly. In some of the Southern States it has proved more destructive to this crop than any other insect. As it remains in the straw through autumn and winter, it may be destroyed and its ravages lessened by burning the straw.

THE GRAIN WEEVIL or GRANARY WEEVIL, (*Calandra granaria*), deposits its egg by boring a small hole into the grain, where it hatches, and the larva eats out the interior, leaving only the bran or shell. Kiln drying the grain is recommended.

There are several other insects that occasionally prove destructive to wheat, but the preceding are the most formidable.

COST AND PROFIT OF RAISING WHEAT.

In those districts which have proved well adapted to wheat raising, it has been found one of the most money making crops—more so before the appearance of the midge than afterwards. George Geddes, in his Agricultural Survey of Onondaga County, estimated the following as the cost of an average crop on a good farm, or 20 bushels per acre, (although 40 bush. are sometimes raised,) with the net profit before the present high prices :

Plowing once,	\$1.50
Harrowing and Rolling,50
Drilling,31
Seed, two bushels,	2.50
Harvesting,	2.00
Threshing,	2.50
	\$9.31
Twenty bushels at \$1.25,	\$25.00
Straw,	2.00
	27.00
	\$17.69

At present prices this net profit would be much greater.

The wheat crop is more liable to uncertainties than corn and oats when all are accompanied with good management; yet with these uncertainties the best farmers obtain as an average at least twenty-five dollars net profit yearly in payment for interest on land, taxes and for superintendence.

John Johnston of Geneva, who has done much for the successful culture of this crop, and has obtained thirty-five bushels per acre on a field of twenty acres, when other fields were badly injured by the Hessian fly, midge and rust, gives the following as the leading requisites of success: "First, a well drained and thoroughly manured and prepared soil—the manure to be applied upon the furrow slice and worked in by the cultivator, harrow or other suitable implement; clean seed and early sowing." For the purpose of preparing and enriching the soil, nothing can be more generally beneficial than turning in crops of clover, as already described in the early part of this article.

Before concluding it may be well to invite attention to the importance of experiments in the horse cultivation of drilled wheat. The land must, of course, be entirely free from obstructions, and care taken to drill the rows evenly. An implement similar to Garrett's Horse Hoe, which takes ten rows at a time, would enable the operator to do the work expeditiously. The advantages would be—a probable increase in the crop, the eradication of weeds, and the introduction of wheat as a hoed crop in rotation. It would, of course, preclude seeding down to clover until a succeeding year.

MANAGEMENT OF HEDGES.

THE TRAVELLER through all parts of the country, and especially in the Western States, is struck with the general bad management of Osage Orange Hedges, with now and then some admirable exceptions.

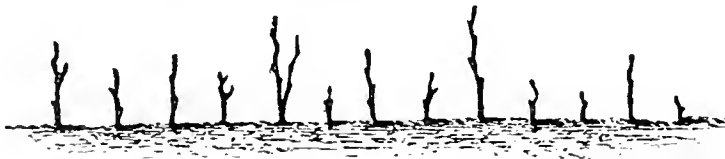


Fig. 1.—Hedge Planted without Assorting, and before Cutting Back.



Fig. 2.—Hedges a "Humbug."

equalities and gaps, as illustrated in the accompanying sketch, (fig. 2.)

The failures are always owing to one or more of the following causes—frequently to all of them combined:

1. Bad preparation of the soil, which is soddy or cloddy, or otherwise badly pulverized.
2. Bad selection of plants, — intermixing large and small, half-dead and vigorous (fig. 1)—resulting in in-

3. Want of the constant cultivation of a broad strip of mellow soil, at least four or five feet wide on each side of the hedge row, for the first three or four years at least, without which the growth will be slow and feeble, when it should be strong and vigorous.

4. Absence of thorough underdraining along the line of the hedge, without which the plants are lifted out by frost when young, or killed by severe winters when older.

5. Neglect of properly cutting back the hedge while forming, to give it a thick or dense bottom.

6. Want of good pruning, which may be entire neglect, or a broad, flat top and thin bottom.

A few additional remarks will be proper on some of these points. If the soil is well prepared, the young trees may be planted not only three times as fast as if badly pulverized, but they will be more certain to grow uniformly, and form a good and early hedge. Selecting and assorting plants is of great importance in preserving an even, uninterrupted and uniform barrier. The plants, before setting out, should be carefully assorted into two or three sizes, and all which are not plump, healthy and with good roots and well-formed buds, should be laid aside and tried another season in the seed bed. Let all the large ones be set in the row together,



Fig. 3.—*Hedge of Assorted Plants not yet Cut Back.*

and the same care observed with the medium and the small ones (fig. 3.) Those which are quite small should be kept in the seed bed for another year, especially if the roots are imperfect. We need scarcely add anything on the importance of cultivation to those who know that young trees as well as a row of corn, cannot flourish or make any growth without the soil is well cultivated.

The difficulty with too many is that they cultivate a strip much too narrow or only two or three feet entire width, when it ought to be not less than eight or ten feet wide. Young trees send off roots on each side about as far as the height of the tree, and a young hedge, the shoots of which grow four or five feet high, will therefore have an extent of roots from tip to tip of not less than 8 or 10 feet, the whole surface above which should be kept clean and mellow, (figs. 4



Fig. 4.—*End View of Young Hedge well Cultivated.*

and 5.) If the soil is rich, the cultivation may be suspended after mid-summer to allow the new wood to ripen. Planting the hedge row within



Fig. 5.—*Young Hedge in Grass and Uncultivated.*

a few feet of a good tile drain is an excellent practice, unless the subsoil has so good a natural drainage that water will not stand twenty-four hours in a post-hole on the wettest day in spring. This thorough drainage not only prevents the young plants from being thrown out by frost, but contributes greatly to the hardiness of the trees in subsequent years. We have known hedges to endure the severest winters when placed over or near a tile drain, while others similarly situated, but without drainage, were killed down to the ground. There is nothing that is more difficult than to induce novices to cut back the plants sufficiently. When set out they should be headed down within an inch or two of the ground, which will make the new shoots spring up vigorously, while without it, the growth will be comparatively feeble. When the plants are fairly started, they should be left to grow about two years undisturbed—in the rich soils of the West one year may do—so that they may become strong and obtain a good foothold in the soil. The process of heading down should then commence, and be continued twice a year until the hedge is formed, which will be in two or three years more. The first cutting back should be within three inches of the ground; the next, three or four inches above that; the next, four or five inches higher, and so on, increasing gradually for each successive cutting. This cutting back is commonly neglected, and the plants run up in a slender and meagre form, thin at the bottom, and heavy at the top. In order to keep the hedge thick below, the common error should also be avoided

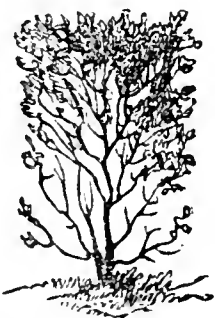


Fig. 6.—*Badly Trimmed Hedge.*

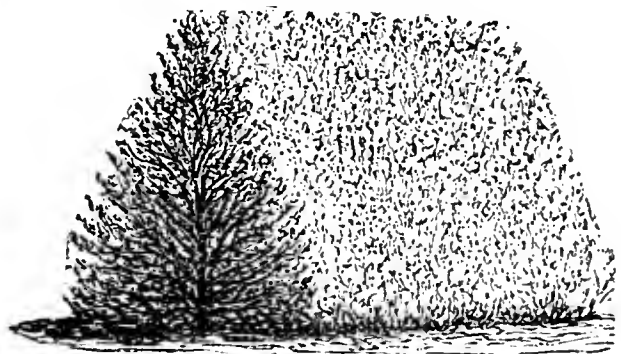
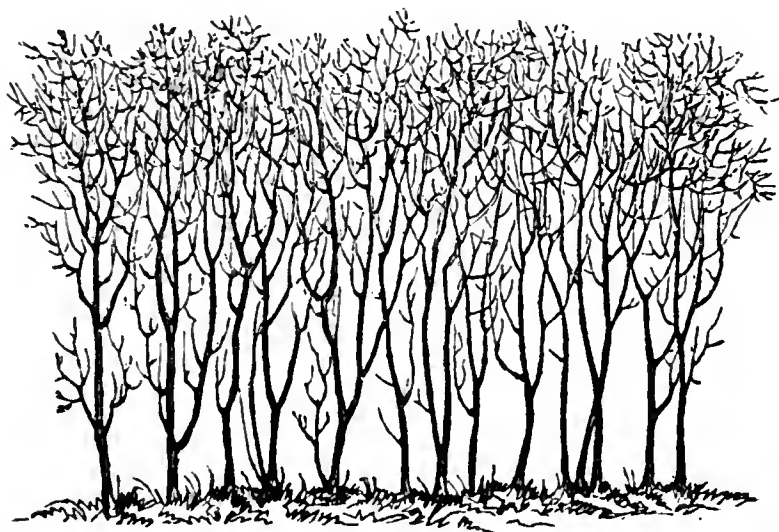


Fig. 7.—*“Hedge a Success.”*

of shearing broad and flat at the top, as shown in fig. 6, which leaves the bottom meagre and open. It should also be shaped to a sharp edge or peak, like fig. 7, which represents a perfect and successful hedge.

It happens fortunately that hedge rows which have been thus neglected may still, by proper management, be made into good barriers. Twelve years ago we had an osage hedge set out on a tenant farm too far off for proper superintendence. A tile drain was placed within a few feet, but

the occupant could not be induced to cut the trees back sufficiently. He thought it looked like "ruin" to cut down young trees which had grown five or six feet high, to within as many inches of the ground; and although in a few years



it formed a good fence against cattle, it had numerous gaps below, and would not exclude small animals. (Fig. 8.) A year ago it had grown about ten feet high, when we directed it to be laid. This was done by one person taking a sharp axe and cutting the stems

Fig. 8.—Hedge allowed to Grow without Cutting Back, as seen in Winter.

—which were now about an inch and a

half in diameter—one-half off, as near to the ground as practicable. When this was done, another person with a pitchfork bent the trees over in an inclined and nearly prostrate position, in an accurate line along the hedge

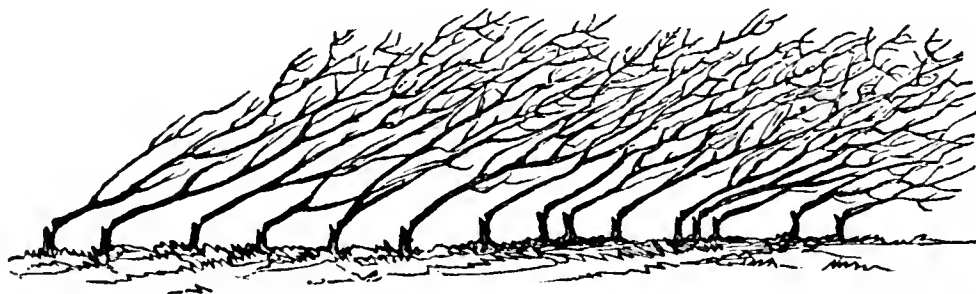


Fig. 9.—The same "Laid," or Prostrated by Cutting the Stem half off near the Ground. (Fig. 9.) If the branches of any of the trees were too broad, they were clipped or cut off with the axe. When this operation was completed, a new hedge had been formed consisting of the inclined trees, which should form an angle of about thirty degrees with the horizon. If the trees are quite bushy or spreading, it will be best to give the axe a long handle, so that the operator may do the work without fear of being scratched by the thorns; and the trees may be bent over more readily and accurately if two men with their pitchforks stand on opposite sides of the hedge. In the course of the season new shoots will spring up from the stubs and stems, and grow several feet high, and thus interlacing the old stems and branches, will form a new hedge (fig. 10) of such strength that the most furious bull cannot enter it.

It is important that the cutting back be done quite early in spring, and before the buds have begun to expand. If left until later, or after growth has commenced, or when the buds are opening, a serious check will be

given to the trees, and they will make but few and feeble shoots. The course just described is well adapted to a farm hedge, and has the

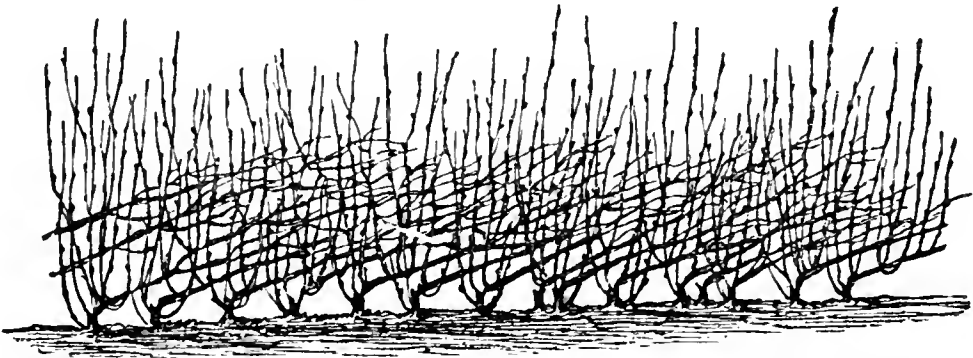


Fig. 10.—*The same after One Year's New Growth.*

advantage that it continues to be a good barrier even immediately after the cutting down has been performed. Another mode of renewing an old hedge is to cut the trees down within a few inches of the ground, and thus allow an entirely new growth to spring up; a year or two being thus required for the new hedge to form, it is not so well adapted to general purposes, but is well suited to door-yard boundaries, as a neater growth may be thus obtained by the removal of all the old brush. If the cutting down is done early in spring, this second growth will be strong and rapid, and the new hedge may be made in less time than by setting out young plants.

CULTURE OF THE POTATO.

THE POTATO, the most important vegetable introduced in modern times, is worthy of more attention in relation to its best management than it generally receives. In furnishing a few directions, it is proper to remark that there is no crop respecting which there is a greater diversity of opinion on several points of culture. Whatever we may say, therefore, will meet with greater or less objection, especially from those who have made single experiments in relation to disputed points, and have fully made up their minds, without further trials under the varying circumstances of differing soils and seasons. We shall endeavor to give such views in relation to the matter, as have been well established by repeated practice under our own observation, or which will probably receive the assent of good cultivators.

The first important requisite is to reduce the soil to a proper condition. Potatoes are sometimes planted on sod recently inverted. In a few instances they succeed well; but they are more likely to suffer from drouth, except in wet seasons, and the practice is not therefore to be generally recommended. It is better to plow the previous autumn, and to reduce the soil to a high degree of pulverization. The additional plowing and harrowing required for this purpose will be repaid several times by the ease, rapidity and perfection with which the planting and subsequent cul-

tivation may be performed. If the seeds of weeds can be well worked out previously, it will save much labor in hoeing, and give a better crop.

The depth of the soil is another important requisite. The roots are less affected by drouth on the one hand, and continued rains on the other, when there is a deep bed of mellow soil for absorbing surplus water when it comes, and for retaining it through dry periods. Every one is aware that a dry season will often reduce the yield of potatoes, under ordinary management, to one-half the usual amount, or even one-fourth, when the summer proves to be an uncommonly dry one. A striking instance was observed on the grounds of a neighbor who had recently made an under-drain through the centre of a small field occupied in such a season with potâtoes. The row which stood over the ditch, where the soil had been made deep and loose, yielded at least double the amount of any other row. Unless, therefore, the soil is already deep and loose, it should be turned over to as great a depth as can be done with a three-horse plow ; and if, in addition to this, a subsoiler can be used, all the better. Such treatment, more than anything else, will place the crop above any contingency of wet or dry seasons. As fresh manure is not the thing for potatoes, deep cultivation alone will be found greatly superior to any manuring in connection with shallow plowing. If the soil is too poor, it is better that the manure be applied to a previous crop—or what amounts to nearly the same thing, that it be evenly spread on the land the previous autumn, allowed to soak in by the washing of rain, and thoroughly pulverized with the harrow the following spring before plowing. Manuring in the hill should never be practiced when there is any fear of rotting, unless with old pulverized manure or fine compost ; and even then it is better if diffused broadcast through the soil, as the small fibrous roots of the plant soon extend several feet in every direction.

A great diversity of opinion exists on the subject of planting whole, cutting in large pieces, and cutting to single eyes, as well as in relation to the depth and distance for planting. All admit that planting potatoes whole, produces a greater number of stalks and more and smaller potatoes. The only advantage of employing whole potatoes is that they do not dry up so soon when planted late or in very dry earth. It will rarely happen that good, well pulverized soil will be found so dry as to require whole seed. Planting in hills both ways may do for weedy land, as more of the work may be done by horse cultivation than when in drills or in rows but in one direction. The last named mode, however, will generally yield nearly double, as more of the soil is occupied with the tubers. The practice of cutting to three or four eyes, or to a single eye, must depend on circumstances. For ordinary management, or where the finest culture and best care cannot be given, pieces with three or four eyes may be planted, twelve to twenty inches apart in the row. This is the mode now most generally adopted by the better class of cultivators. But if the soil is in the finest condition, a larger crop, with more uniformly large potatoes, may be obtained by adopting the single-eye mode. For this purpose the tubers should be of fair size.

and be cut some days before planting, so as to form a thin, dry crust on the cut surface before depositing in the ground. Some cultivators regard it as important to roll the pieces in slaked lime or plaster, while others entirely disregard it. We are unable to say what degree of value the practice possesses. The distance should not exceed eight or ten inches in the row, but may vary with the character of the variety for spreading at the top and at the roots—some varieties forming more compact masses of tubers than others.

There is another point upon which opinions differ—namely, the influence of the size of the seed. It is commonly believed that small potatoes reproduce small ones, and that the crop is lighter than from large potatoes. This opinion is partly correct and partly erroneous. When small potatoes are planted, culls are commonly used to fill out vacancies and spare pieces of ground, which receive less care than the better and earlier planted portions of the field. Again, small potatoes are oftener planted whole, yielding numerous stems and tubers at the expense of quantity. Hence the common opinion that small potatoes reproduce small ones. The truth is, that the tubers are strictly underground swollen stems, the eyes being the buds; and large ones tend no more to reproduce large ones than large sticks used for grafting will ultimately make the largest trees, or than small trees set from a nursery will never spread out and form such bearers as large nursery trees. When the large and small potatoes are cut alike, with the same number of eyes, and planted in fine mellow earth, at a proper depth, where the moisture is sufficient to impart vigor to both without drying, the difference in the size of the potatoes yielded will be scarcely perceptible. This experiment we have repeatedly performed, and it accords with many reported results, where the above mentioned precautions are taken. There is generally, however, a difference in favor of the larger seed, ascertained by careful measuring, and resulting doubtless from the greater vigor at the outset given to the young plants by the larger quantity of nutriment in the pieces. This difference, small as it is, and generally imperceptible to the eye, is, however, sufficient to amount to several, and sometimes many bushels per acre—sufficient to warrant the selection of good medium-sized potatoes for seed. Two inches or two and a half inches in diameter is a suitable size. If much larger, they are little or no better, although requiring a large additional amount of seed per acre. For example—a potato three inches in diameter contains more than three times the bulk of one two inches in diameter, and twenty-seven times the bulk of one an inch in diameter. A large potato, measuring four inches, will be sixty-four times the bulk of one measuring but an inch, and consequently sixty-four bushels of the larger potatoes would be required to afford as many eyes or stems as would be found in a single bushel of inch potatoes.

The tuber resembles the graft or shoot in another respect. The eyes at or near what is termed the root end, are smaller and more dormant than those at the eye end, in precisely the same way that the lower buds of a shoot on a tree are smaller, and are more tardy in breaking, than the upper

buds, while the terminal bud, like the terminal buds of the potato, is larger, and breaks sooner or more freely than any other. It is for this reason that those who raise potatoes for early market cut off the eye ends and keep them in a separate basket for early planting—reserving the rest for the main crop, and rejecting the root end altogether.

As already remarked, it is important for successful and rapid planting

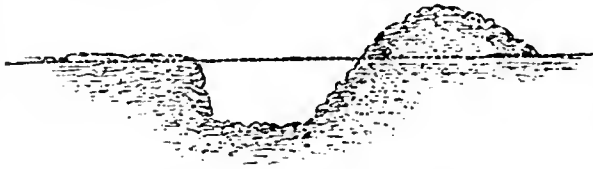


Fig. 1.—*Furrow made by Common Plow.*

that the soil be uniformly mellow, with a smooth surface. It may then be evenly furrowed and fitted for easy covering. A common one-horse plow is usually employed for making the furrows, but is objectionable from the fact of its throwing the earth out on one side, and leaving a flat bottom. A shovel plow, or any implement operating like one, is better because it

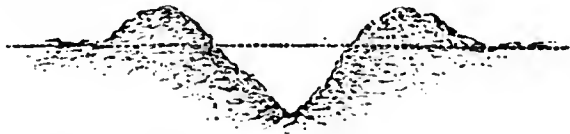


Fig. 2.—*Furrow made by Shovel Plow.*

throws the earth evenly on both sides, leaves a quantity of mellow earth in the furrow, and forms a sharp, narrow trough at the bottom, causing the plants to stand in a perfectly straight row if the furrowing has been skillfully done. The person who drops may fix the exact place of every set with his foot as he passes, by pressing it into the mellow earth. It is said to be better to place the skin side down and the cut side up, because this enables the roots to descend better, but we have not tested this point by trial. Different modes are adopted for covering the rows. If the furrows are deep enough, and the sets have been pressed into the soil, the covering is sometimes effected by using an inverted harrow drawn by one horse, passing between the rows and covering two rows at once. Any harrow with very short teeth will answer. A slower, but more perfect way, is to use a cultivator, furnished with mould-board teeth, taking out the central one at the place of the row, and setting the others so as to throw the earth upon the furrow. Still another way is to cover with a light plow, but unless the work is very carefully done, the seed will be buried two or three times deeper at some places than others, and the rows will be uneven. On a small scale it will be obviously best to cover by hand. When many acres are to be planted, it would prove a matter of economy to procure one of True's potato-planting machines (fig. 3.)

This machine cuts the potatoes, makes the furrow, drops the pieces at even distances, and covers them at a uniform depth—all at one operation. A single horse is attached to the machine, and any person accustomed to driving a horse in straight lines, can do the work; if the ground is in good order he will plant five or six acres in a day. An easier and more perfect mode is, first to mark the land with a corn marker, and then place a boy on the horse with the direction to keep him on the line. The man who has charge can then give his whole attention to the work directly before him. If the ground happens to be rough, or dry from lateness of season,

it is better first to furrow the land with a plow; this will effect deeper planting. The accompanying figure (fig. 4) represents a section of the soil after the planting has been performed—the earth being scooped out on

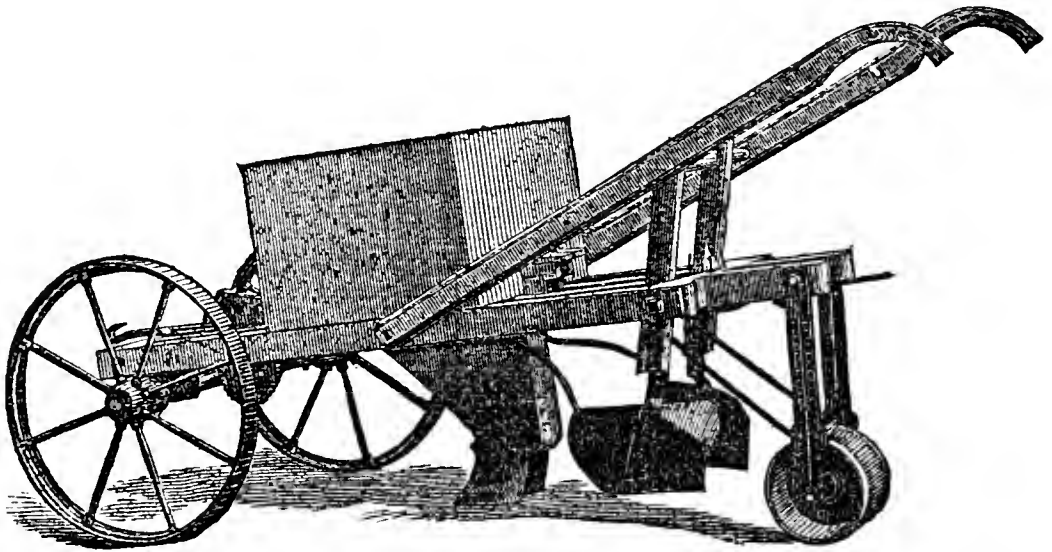


Fig. 3.—*True's Potato Planter.*



Fig. 4.—*Section of Work Performed by True's Potato Planter—*a*, Potato.*

There is one important requisite for success which sometimes being unobserved, the machine is pronounced a failure. Care must be taken that

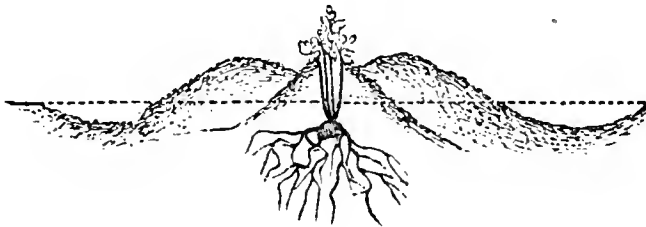


Fig. 5.—*The same after Ridging with Cultivator.*

no potato large enough to choke the orifices is thrown into the hopper. These orifices, which are at the place of the cutting blades, may be readily expanded or contracted, so as to fit the size of the potatoes, and to prevent more than one passing at a time. The potatoes must be assorted beforehand, which may be done on some previous rainy day, with one tenth of the labor of cutting by hand. If only the larger potatoes are planted, they may be assorted into two sizes; if all are planted three sizes should be chosen. The orifice should be somewhat larger than the potatoes, and, if there are any long tubers, cut them in two.

The depth of the covering is obviously a matter of considerable importance. If too deep, the shoots will be long in reaching the surface and the general growth will be retarded; if too shallow, there will be danger of injury from drouth. Generally, potatoes do best when planted as early as good pulverization will admit, at which time the earth is commonly

moist enough to allow a depth of covering of not more than two or two and a half inches. How far a deeper or shallower covering would affect the amount of the crop, under varying circumstances and seasons, would be worthy a series of experiments.

A great point is to avoid, as much as possible, the labor of hand-hoeing. Much may be done by previous clean cultivation. The next thing is to harrow the whole surface with a short-toothed harrow, (or with the teeth of a common harrow driven back,) just before the plants come up. Generally about this time the weeds in the soil will be making their appearance. A good harrowing when they are only half an inch high, will be incomparably better and more effective than after they have grown some inches. This practice obviates the necessity of early hoeing, as it kills the weeds in the row. Some cultivators harrow again when the plants are two or three inches high; for although a few are injured or broken, they soon recover, and the saving of hand labor is of greater consequence. If done with an old harrow, the teeth of which have become rounded and worn so as to point backwards, there will be less danger of cutting the plants—this second growth of weeds being so small as to be easily destroyed, while the potato plants are scarcely injured. It is important that these operations be done exactly at the right time, as a few days would alter the whole aspect. The subsequent cultivation may be performed by suitable horse cultivators for throwing the earth towards the rows and rounding the surface slightly. Two-horse double cultivators should be used in large fields.

Any one may become thoroughly satisfied of the great superiority of the routine just described—namely, clean soil, deep cultivation, mellow and smooth surface, and hoeing by harrowing—over the more common practice of plowing shallow, forming a hard or cloddy surface, planting wholly by hand, and imperfectly at that, forming crooked rows which cannot be cultivated closely to the plants, and hoeing by hand when the weeds are a foot high—by observing the results side by side, and comparing the heavy cost and meagre crop of the last described mode, with the cheaper process and heavier product of the former.

Digging potatoes should be done early, or as soon as the dying of the tops, or their destruction by frost, shows that growth is at an end. If deferred, the late autumn rains may render the soil muddy, making the work more laborious.

The cessation of growth in the tubers may be determined by rubbing the skin with the thumb. It peels freely while they are growing rapidly; but adheres firmly when growth has ceased. If from frost killing or other cause it becomes necessary to dig them before ripe, they should be carefully handled and placed in shallow temporary pits, or on a barn floor. In the course of a few weeks the skin will adhere more firmly to the potatoes and they may be handled safely. Cellars are usually too warm for them during the early half of autumn, and it is better to allow them to remain out, covered with straw until the approach of cold weather, and if

properly protected from rain, they will become quite dry and may be thoroughly cleaned for winter storage.

The old mode of digging by hand is only to be adopted for small patches. Dr. Hexamer's six-pronged hoe is however an excellent

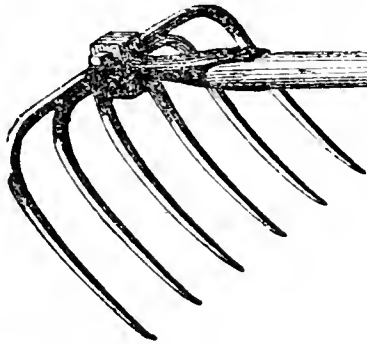


Fig. 6.—*Hexamer's six-Pronged Hoe.*

implement for this purpose. A number of digging machines have been patented and manufactured within a few years. All of them, so far as we know, have operated well, and proved labor savers, but more time will be required to determine which is best for general use. As they usually work by sifting the soil from the roots, they succeed best on a sandy or other light friable soil, and less perfectly on one that is tenacious or clayey.

In the absence of any digging machine, we have found a good mode, on adhesive soils, to consist in throwing out the potatoes with a common plow, run carefully at a proper depth, and when these are picked up the remainder are thrown out by first harrowing lengthwise with the furrows, and afterward cross-harrowing. In this way two men will harvest in a day three times as much as by hand digging.

One of the best preventives of rotting, consists in having the potatoes perfectly clean before stowing away for winter. Hence the importance of selecting dry weather, when the soil has not been soaked by rains. But if mud cannot be avoided, care should be taken to remove it. They may be drawn in and spread on a barn floor, and in a few days they will be dry enough for storing away. We have found the revolving box, represented

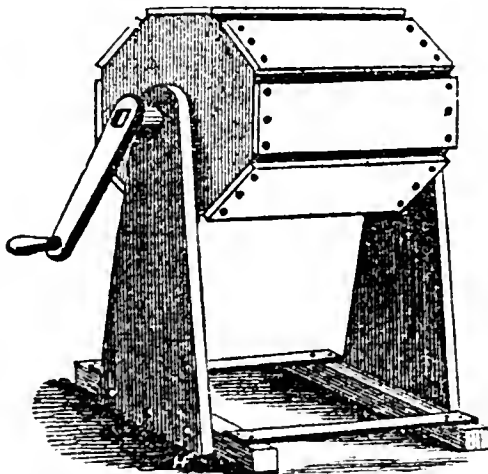


Fig. 7.—*Revolving Box.*

in the annexed figure, to answer an excellent purpose—the earth dropping out through the slits between the boards. One of these boards being hinged and buttoned, admits the potatoes. The motion should be moderate, to prevent bruising. A more perfect way is to provide a longer revolving trough placed in a stream, where it will rapidly wash the tubers in a thorough manner.

Different modes are adopted for keeping potatoes through winter. A good way is to place them in large boxes, covered from the light, in a cool dry cellar. Tree boxes, or such as are used by nurserymen for packing their orders, are a convenient size and answer a good purpose. These tree boxes are often cast aside as useless when received, or else split up into kindling wood. The bottom should have slats or openings between the boards. They should be placed on

blocks a few inches from the ground or floor, so as to admit ventilation,

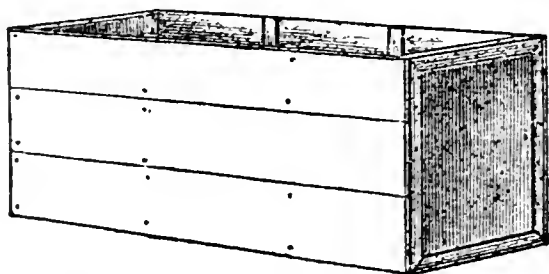


Fig. 8.—Box for Storing Potatoes.

—an important preventive of the rot. Potatoes may be buried out of doors, and will keep well if the work is properly done. Three requisites are necessary—ventilation, freedom from water, and protection from freezing. Large quantities of potatoes are spoiled every year, by not attending to these particulars. Ventilation is effected by making a hole at the top and filling it with a large even wisp of straight straw. Farmers have often observed that their potatoes were rotten at the top of the heap, and have erroneously supposed that it came from freezing, when, in fact, it resulted from the foul air which had no escape. The best way is to use a large quantity of straw with a thin stratum of earth, instead of the more common practice of using but little straw and much earth. We have found the practice of placing sixty or seventy bushels in a heap, covering with a foot of packed straw and three inches of earth, has been uniformly successful, not one per cent. generally being lost by keeping through winter. The accompanying cut gives a section of such a heap, and shows the manner in which the work is performed.

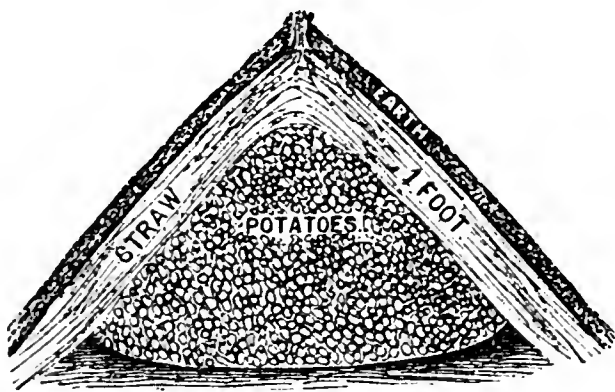


Fig. 9.—Section of Potato Heap.

The heap when finished should have the outside earth beaten hard and smooth with a spade, so as to throw off the water of rains.

Many varieties of the potato have been raised and cultivated, and diversity of opinion exists in relation to their value. This is partly in consequence of a want

of full trial, and partly from the fact that many of them succeed well on some soils and imperfectly on others. We notice briefly a few of the leading sorts. Among the older varieties, the *Long Pinkeye* was one of the best—white, with purple eyes, very white flesh, and fine and delicate in quality. The tubers spread much in the hill, it did not yield well, and the sort has now nearly passed from cultivation. The *Round Pinkeye* was larger, with a yellow flesh, more productive, but poor in quality. The *Mercer*, with purple streaks through the flesh, has long been one of the best table sorts; but as it often rots badly, its culture has been discontinued, except on light and dry soils, where it still succeeds well. The *White Mercer* is a sub-variety without the dark streaks. The *Early June*, large, white, roundish and smooth, has long been a fine early potato, but is now superseded by more productive sorts. The *Buckeye*, a large, early

potato, with deep reddish eyes, is a fine early variety, but has the formidable objection of being frequently hollow. The *Dykeman* is a famous early variety, much cultivated in the vicinity of New-York city, but we have found it to yield small crops. The *Prince Albert* is a widely known, very productive and popular white potato, long and flat, often tapering and curved at the smaller end. It is commonly of good quality, particularly if kept till spring. We have found it of late years much more liable to rot, and yielding less than some of the newer sorts. The *Fluke* somewhat resembles the *Prince Albert*, and although occasionally excellent, is often only of second rate quality. The *Jackson White* is a good potato, but is not productive. The *Orono* considerably resembles it and yields much better crops. The *Carter*, although considerably affected with the rot, is still cultivated to some extent, and is not on the whole excelled in quality.

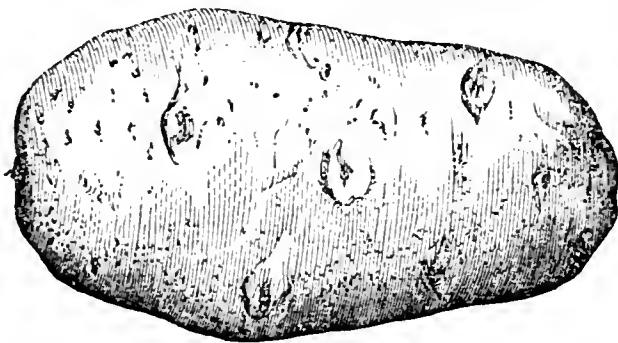


Fig. 10.—*Early Goodrich*—Reduced one-half in Diameter.

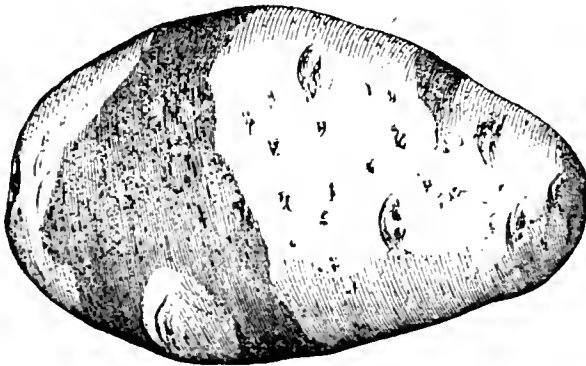


Fig. 11.—*Calico*—Reduced one-half in Diameter.

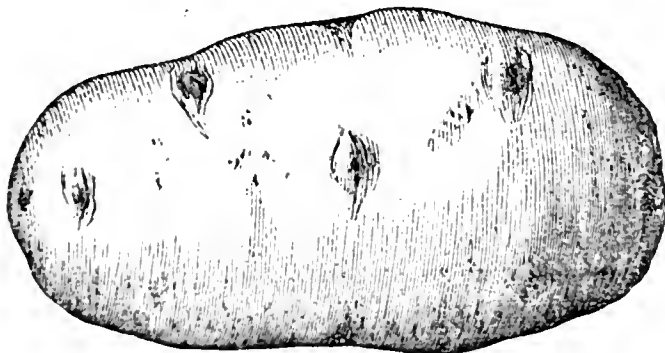


Fig. 12.—*Harison*—Reduced one-half in Diameter.

But all these sorts are becoming more or less superseded by the best of the *Goodrich Seedlings*. Some of them introduced several years ago, although very productive, have not proved of the highest quality. The *Cuzco*, for example, has yielded on the grounds of the writer at the rate of five hundred and twenty bushels per acre, and there was but one objection to this sort—namely, that the potatoes were not good for anything. The quality, however, is not uniform, and in some localities, or in certain seasons, they have proved tolerably good. The *Garnet Chili* has been widely introduced, and is a good hardy sort of medium quality. The later sorts, however, are much the best of the *Goodrich* varieties. Perhaps no potato ever raised has proved a greater acquisition than the *Early Goodrich*, (fig. 10.) Taken altogether, we know of no early potato that will approach it for general value. It is quite early, yields largely, has scarcely

ever been affected with the rot, is excellent in quality, and is a good keeper. The *Gleason* and *Calico* (fig. 11) are later sorts, and about equally productive and excellent. If they succeed as well in all localities as where already tested, they will, at least for a time, become the principal or standard late varieties. The *Harison* (fig. 12) has been less tried—it is very productive, has yielded four hundred bushels per acre, but in some places its quality has hardly come up to first rate.

IMPROVED SINK.

By L. D. SNOOK, Yates County, New-York.

MANY A HOUSEWIFE has washed her dishes for years on a table. The consequence is each time the table is soaked with grease and water, dripping on the floor and soiling dress and apron. Husband, if you have no sink, and if you desire to please your better-half, and save buying a few more yards of calico each year, also to improve the appearance of your kitchen, then proceed to make, or have made, that necessary article, a sink. The one illustrated below is cheap and quite simple

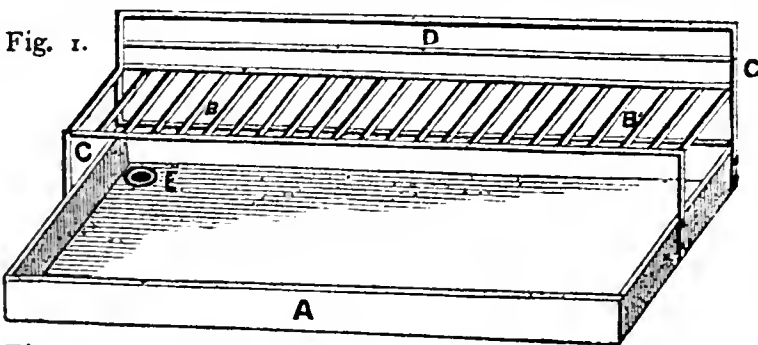
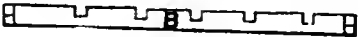


Fig. 2. 

Improved Sink.

Dishes will be washed in a pan on the bottom of the sink, and placed in an upright position on the grate B, and resting against the cross slats D. Knives, spoons and all articles of this class are laid on the grate B. Standards C C are 1 by 2 inches; short ones 6 and long ones 14 inches in length above the top of the sink. Long slats D are $\frac{1}{2}$ by 1 inch. Those in which the slats B B are morticed are 1 by $1\frac{1}{2}$ inches, hard wood. A section is shown in fig. 2. It is 8 inches long, 1 by 1 inch square, and notched as shown. For plates eight, and for saucers ten notches are made in each slat—for plates the slats are placed four, and for saucers three inches apart.

Placing dishes in a vertical position they soon drain off; consequently you can wipe more dishes, and those *cleaner*, without changing the towel. All refuse water passes through the discharge pipe E. Hang the wash-bowl upon a nail driven in the frame above E. The whole should be

painted and varnished before being used. It should be about the height of a common table, and underneath, a closet in which to keep kettles, dripping pans, bake tins, &c. Set the water pail on a bench at the side of the sink. Many more little conveniences could be added, but they will readily suggest themselves to the reader.

FARMERS' GARDENS.

THE COUNTRY IS FULL OF RURAL IMPROVEMENTS— but the improvement of farmer's gardens is not one of them. With a few honorable exceptions, they are the places, of all others on the premises, to find a mass of rank weeds. We have just driven past the garden of one of the best farmers in the country. The farm was a pattern of neatness—handsome board fences—not a weed to be seen along the division lines—fields perfectly clean and well cultivated—and luxuriant crops in every direction. The farm contains a little over a hundred improved acres, and the owner has cleared over two thousand dollars in a year from it. But how about his garden? It was hard to say whether weeds or vegetables had the ascendancy. The sweet corn at one end was rather taller than the fox-tail; the cabbages could be occasionally seen through openings in the pigweed plantations, and the early potatoes had been dug without interfering with the rank growth of other plants. In another garden a few rods distant there was an evident struggle between a refined taste on the part of the woman and utter neglect on the part of the man. One spot eight feet square, brilliant with Japan Pinks, Petunias, Asters, and others of the finest annuals, formed a perfect gem—a sort of oasis in the desert, if the term desert may be applied to a handsomely fenced quarter acre of rich land covered with a promiscuous growth of ragweed, mustard, thistles, fox-tail grass, &c. If there were potatoes, beets, parsnips and onions beneath this growth they could not be seen. There is no use in disguising the matter—there is a shameful neglect all over the country in this respect. If it were a mere matter of taste, we should not urge the point so strenuously; but while so many farmers place money-making and money-saving at the head of their list, they ought also to know that nothing contributes more to supply a table with luxuries at little cost than a good kitchen garden. This term includes the small fruits as well as vegetables. Strawberries and raspberries, gooseberries and currants should be seen on every table in early summer, and nothing would more promote the health of a family.

The trouble is that the garden is not made a main object—it takes the last chance. If the corn is to hoe, the garden must be neglected till it is finished.

The only way to effect a reform is to take hold of the thing in earnest,

and let the garden come first, and the corn, potatoes and wheat follow after. Let this matter be planned before-hand and made a part of the prominent business of the season. If a half acre is too much to attend to, take a smaller patch, and let it receive first rate attention. A good garden may save one, two or three hundred dollars in butchers' bills and doctors' bills. If rightly planned it will not cost half the labor to keep in order as a single field on the farm, and will be less trouble and expense than is usually required for fighting weeds all summer in farmers' gardens as commonly seen.

First let the ground be made right. If too wet, underdrain it as you would any other portion of the farm. Being small, this need not cost five dollars. It need not be trenched by hand at an expense of fifty dollars, but it may be plowed deeply—trench plowed and subsoiled—working in at the same time a good quantity of manure at a very moderate cost. If foul or weedy, summer fallow it one year by plowing occasionally and harrowing it once a week until rendered perfectly clean. Then, to economize labor, lay out the garden so that most of it may be cultivated through the season with a horse. The small vegetables, such as onions, lettuce, radishes, &c., which require "beds," may be placed in a strip along one side, but peas, beets, beans, early potatoes, sweet corn and cabbages, may be put in handsome drills, and worked with a modern fine cutting cultivator, which will do nine-tenths of the work. Do not leave this cultivating and dressing out to the latter part of the week, when unfinished jobs have accumulated and must be hurried through in order to clear the Sabbath; but let the garden have the precedence of everything else on every Monday morning, until every square foot is as mellow as an ash-heap, and as smooth as a floor, and not a weed is to be seen. Let this course be carried out faithfully and energetically, and the cost will not be so much as it now is with the majority of farm gardens. The products and profits will be immeasurably greater.

FRUIT ROOMS.

IT WAS FORMERLY a common practice to keep vegetables, pork barrels and fruit, all in the same apartment in the cellar. The fruit was sure to imbibe any bad odors, and its freshness and flavor were, of course, injured. If the cellar was too warm, the apples would decay rapidly—which would be accelerated by an excess of moisture. Good managers have adopted the practice of making a separate apartment for their fruit, where the air may be kept constantly pure and cool, and everything imparting a bad odor carefully excluded. If the cellar happens to be too damp, a coating of water lime on the sides and bottom will render it quite dry enough. There should always be at least one thermometer in a fruit

room and the temperature kept down as near freezing as may be practicable. Two thermometers, one for the upper and the other for the lower stratum of air would be preferable. The windows should be hung on hinges on opposite sides of the room, so as to admit necessary ventilation. For controlling the temperature, they should be made to fasten at different points, so as to let in little or much air at pleasure. Rolling blinds in connection with the windows are useful.

Apples may be kept headed up in barrels till near their period of full maturity. Baldwins and Greenings, for example, if carefully picked, may remain in headed barrels in such a cool cellar until about spring; and Northern Spies and Russets several weeks later. As soon as danger of decay is apprehended, the barrels should be opened and the fruit assorted. A more perfect mode is to bed the fruit in the barrels in baked sawdust or in perfectly dry, soft chaff, (the chaff of timothy is best,) which will absorb the moisture, preserve a cool and even temperature, and prevent decay. Apples thus packed and kept near the freezing point, will remain fresh a long time; and if an occasional cold snap should cool the cellar a few degrees below freezing, the chaff or sawdust will prevent them from becoming frosted.

Fruit required for consumption during winter, is most easily kept upon shelves. These shelves should be in the middle of the apartment, with a passage extending all around, both for easy access and for more uniform ventilation. The shelves may be about five feet wide, which will enable the attendant to reach the middle from either side without difficulty. If much wider than five feet, this cannot be done. An apartment which is nine feet high may have three successive shelves, one above the other, with a space of two and a half feet between each for ready access, the lowest one being within a foot from the floor. A board 5 inches high, extending around the edges of each shelf, will be sufficient. For keeping pears, these shelves should be furnished with lids or covers for the exclusion of light; or flat movable boxes will answer the same purpose. If provided with covers, and if made of the right size, they may be placed compactly upon the shelves side by side.

The size of the fruit cellar may vary with the amount of fruit to be kept.

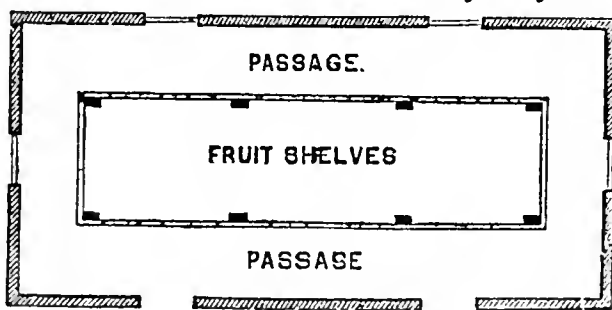


Fig. 1.

Fig. 1 represents an apartment of moderate dimensions. If the shelves are five feet wide, and a passage two feet and a half extends around them, the interior will be 10 feet wide, and the length may vary indefinitely. It is about twenty feet, as shown in the plan, and the

three fruit shelves will be each five by fifteen feet, holding fifty or sixty bushels. This amount will be as much as most families will need for an abundant supply until spring, and the fruit will last longer if such as is

needed for pies and stewing are carefully picked over and separated on the first appearance of decay, by the owner or some reliable person. If left to hired girls, they will be sure to select the hardest and soundest, and leave the decaying ones, so that in a few weeks the whole will be a mass of decomposition. A larger and more perfect fruit department is represented by fig. 2, which is nearly twenty feet wide, and has two series of shelves, and one of drawers for pears. A place for storing barrels of fruit may be left by making the shelves two feet shorter at one end. It will be observed in both of these plans that windows are placed on opposite sides, so as to allow a free passage of air—either of which may be occupied as a door, according to circumstances.

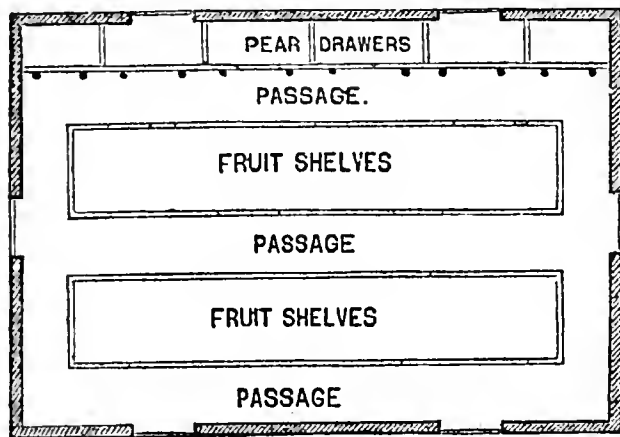


Fig. 2.

If these rooms constitute a part of a common house cellar, and the ventilation cannot be on every side, there will be no difficulty in selecting two opposite sides or ends for this purpose. The separation from the rest of the cellar should be effected by means of an eight inch brick wall.

A cellar under a grain barn, where the temperature may be more perfectly controlled, will generally be found best for keeping large quantities of fruit. The floor should be double, with a space of air or some non-conducting substance between. A single brick wall within common cellar walls, with an inch or two of interposed space of air will render the cellar more perfect.

Cellars are usually too warm in autumn at the time of fruit ripening for the best success. Winter fruit is therefore commonly kept in cool out-buildings until the approach of cold weather. But a more perfect way is to construct the fruit room entirely above ground—the walls being made double or lined, and the same care taken with the floor above. Into this apartment the fruit may be placed as soon as gathered, as it may be kept as cold or colder than any out-house by opening the windows on cool nights and closing them during warm days. The frost-proof walls will exclude cold in winter, and, if necessary, the heat of a small stove may be added. Artificial heat will, however, be scarcely ever needed, provided care is taken to keep the house closed during the coldest weather.

PREVENTING RUST.—Plows should be kept bright and ready for use in spring. These, as well as all cutting tools, may be preserved from rust by a very thin coating of grafting wax—which will be very convenient for all those who are in the practice of doing their own grafting. Those who have no grafting wax may take three parts of lard and one of rosin and melt them together. This will make an application more easily applied than the wax, and which will answer an excellent purpose.

RURAL IMPROVEMENTS.

Written for the ANNUAL REGISTER by ROBERT MORRIS COPELAND.

RURAL IMPROVEMENT is a simpler title than Landscape Gardening for the art of laying out grounds, so that they shall have as many agreeable and attractive features as is consistent with their size and character, and the means and tastes of the owner. The possibilities of beauty in a country place depend on all these conditions. It would seem at first as if whatever might be one's means and taste, he would be obliged to confine his undertakings to the character of the land he owns. But money is potent, and by its aid a naked rock, the most sterile sand, the hardest clay, or the worst bog, may be changed into a lawn or garden. But, on the other hand, while a lavish expenditure of money may be required to make one piece of land beautiful, the adjoining field may have such natural features that a small sum will develop a great amount of beauty. These facts point out the importance of wisely selecting the place one wishes to make into a home; the choice of location may be worth more than the final cost of laying out one's country place.

As the cost of rural improvement is always large, it is not strange that men should try to lay out their places for themselves, aided by the knowledge which they may get from books and newspapers, and so save whatever percentage of the cost would be the fee of a professional adviser.

I hope in this article to be able to add something to the general stock of ideas upon these subjects. To make my counsel understood, I must first refer to the value of professional advice to all who wish to get the best results from their land at the least cost, and in the quickest manner. A wise selection of the site of the future home is of such great importance that one should carefully consider all the pros and cons before a final decision is made, and here we particularly feel the value of experience. A man who devotes himself to laying out country homes, sees at a glance the capabilities of any piece of land, and if he properly appreciates his employer's condition and wants, can tell before a dollar is spent whether a purchaser should prefer one house lot to another. A short examination of different lots will generally show him which offers the most capacity and promise of beauty at the least constructive cost. As it will cost many hundreds or thousands of dollars to make even the simplest village home, can it be doubted that the improver would be wise to spend a reasonable percentage of his cost in deciding about the best location, which may save him hundreds of dollars in after expense?

When the improver has come into possession of the land on which he has decided to live, there must be a house, an avenue or path, some grass or lawn, some kitchen-garden, some fruit trees, some shade and ornamental trees and shrubs, some fence and some cultivation. All these "somes"

represent dollars which must be expended, whether well or ill, or else the land will be a barren purchase. If there is a difference between getting the most or the least, or a medium amount for the money necessary to be expended, and the wisest method can be learned by paying one who makes it his business to know what can be done for convenience and beauty, with earth, grass, trees and buildings, is it not poor economy to withhold the commission? Supposing when the purchaser is about to build, it seems to be a question of interest whether the house should be set ten or twenty feet north, south, east or west of any particular place, and that we must pay to obtain the opinion of a skillful and experienced person, how small such a fee is in comparison to the cost of rectifying a mistake after the work is done. I need not follow out this argument in its application to the detailed treatment of the country place—what is true of a part is equally so of all.

But the question may rise in the in the improver's mind, is there any one more competent than I am to give me these decisive opinions—how can I tell whether those who profess to teach have the capacity which they claim?

Most of those who offer themselves for such services come under the title of landscape gardener, landscape architect, &c., but the title proves nothing, and may serve only to cover pretentious ignorance. The term landscape gardener, is as indefinite as it can well be, for we combine a word, landscape, which has the broadest significance, with one, gardening, which is of very limited application—but without discussing the word, let us consider some of the qualifications which should be possessed by the individuals who assume the title and practice the art.

In selecting a physician or lawyer we are guided by their skill as shown in their acknowledged work; is it of less importance to weigh a man's capability who is to form the grounds where all our interests and pleasures are to centre. We should look at the tastes, habits and occupation of the proposed guide, for it may be reasonably assumed that no one is fit to create beauty and arrange grounds so as to increase their charms who is himself indifferent to the beautiful. Because a man can graft, plant trees, hoe, trundle a wheelbarrow, or raise fruit, is no proof of his fitness to design and lay out the general treatment of one's place, any more than the compounding of mortar and carrying the hod converts the laborer into an architect or master builder.

Besides loving and studying nature, and continually planning how to combine natural objects so as to produce harmonious and beautiful results, a rural improver should be sufficiently cultivated in mind and social qualities to understand what makes the refinement and elegancies of a home, and should be able to set before his employer a high standard of fitness and taste. He should appreciate the present and future possibilities of his client's social condition, and try to treat the surroundings of the home in such a manner as to act favorably on the family itself. Many of the men who profess to lay out grounds, and who have the merit of familiarity with

all the details of garden work, acquired their knowledge, as under or upper gardeners in large places in Europe or this country; and having seen what some wealthy people require, without understanding why, they assume that what is sauce for goose is sauce for gander, and carry out a settled formal and stereotyped method of laying out and decorating any places entrusted to them. To such men we owe the nauseating repetition of straight avenues, rows of trees, semi-circular drive ways, sinuous paths, terraces, rows of balsam firs, clumps of Norway spruces, maples, &c. They use, so often and abundantly, the best things in a meager and tasteless manner, that at last we revolt at what are called country places, and sigh for free and untrammelled nature. Good advice is worth twenty per cent on the cost of any proposed improvements, while bad or weak advice adds twenty per cent to the cost in actual loss of what might have been obtained from the money which has been expended. It may seem in a practical article almost supererogation to dwell at length on these facts, but I consider a full understanding of the motives which should influence the improver at the outset, of prime consequence, and that a misapprehension of the spirit in which improvements are to be undertaken, will be almost fatal to any good results. A correct understanding of these points is as important to the man who makes his own plans as to the professional man, whose place he supplies; both are to do the same thing, and should be governed by the same principles and motives. In laying down a few principles for treating grounds, I shall not expect to exhaust the subject; it is too large to be fully discussed in narrow limits, but rather to stimulate the reader to study carefully before he commits himself to any proposed method of treating his present or future home.









The greater number of country places are small; perhaps the majority do not exceed half an acre, and in so small a place it seems as if one could not make a mistake. It is very common to hear the owner of half an acre say—I agree with you that when a man is going to build a fine house, and have a large estate, it is very important that he should get good advice, and begin right; but my place is only half an acre, and it can't make much difference what I do to it. This is specious, and sounds reasonable, but is entirely wrong—the large place, by its size, covers many blunders and mistakes—we cannot see it all at once, and if one part is bad, some good feature will attract our attention elsewhere and redeem the blunders. Nature is ever kind and ready to assist us, and trees and shrubs, though badly planted and grouped, will in time get size and beauty of leaf and flower. If there is only breadth in the management of the estate, and large masses of trees, and a few lawns have been made where there can be variety and play of light and shade, in time we are sure of some beauty. The owner of extensive acres will probably be rich, and can afford to make mistakes and correct them. Not so the poor man, whose narrow limits are ever present, and whose scanty area must be always seen at once. We cannot hope to have breadth of lawn, with its light, and masses of trees with their shadows in half an acre—a few trees and well selected groups of shrubs

upon some little grass plot must give our variety and beauty. The poor man and the small place must make much of what there is—every blade of grass must be made to tell, and there must be no mistakes to require either increased expenditure for their remedy, or remain a blot ever present and annoying. As the man of large means and many acres will generally seek aid from professional persons, I shall, in the few plans I offer to illustrate this article, confine myself to small places, and give such advice and directions as will help those who live in village homes, rather than the owner of the country place. I might easily prepare a series of plans which would exactly express my ideas, and then what could be done where one could control all the condition of surface, size, expense, &c., but instead of that I shall give some plans actually made, where the problem was to take a certain number of lots already offered for sale, of small and nearly equal size, and produce the greatest amount of variety.

Many persons, as I have before said, think that all small places might as well be arranged in one way as another, and my object in treating these small lots was to show that sameness and repetition are by no means necessary. These nine lots of land lie on opposite sides of a street in one of our suburban towns; four of them are surrounded by streets—five front on a street and extend back to a low, boggy marsh, through which a feeble stream slowly meandered. From the street to the stream is a uniform slope, though broken into various undulations. The conditions of the plan required that arrangements should be made to give a house, barn, avenue, some lawn and some kitchen garden, to each place. As a matter of choice I should have left out the barns if I could, as it rarely happens that nine persons living in a suburban town, on adjacent lots of half an acre in size, will require a barn, but as the barn was demanded by my employer, I have provided for it.

I will first describe the five lots (fig. 1) bordering on the stream. Believing that there is nothing more beautiful in the country than well managed water, whether running like a brook, or detained in a pond, I determined to drain the upland and marsh into a brook, which, by changes of level in its bed, I could at some places open into small ponds, while at others the brook character should be especially retained. The first step was to arrange the water in lot No. 2. I made a pond which extended part way into No. 1, while it gave rise to the branches of a brook, which, passing into three, combined into one stream, and then swelled into a second pond. Leaving these, the water follows a narrow channel, because the land rises abruptly towards the street, and also declines more rapidly towards No. 5, giving the water a quick flow. In No. 4, although the inclination towards the north is less, the abrupt bank on the west did not permit the stream to be enlarged into a pond. This treatment of the marsh, converting it into water, made a great change in the desirability of these five lots of land. Before the improvement they were less valuable than those on the square, because a portion of their surface was unavailable, and no one person could have improved or drained his lot

EXPLANATION.

-  *Everg'n Trees*
-  *Deciduous do.*
- P** *Pear Trees.*
- C** *Cherry Trees.*
- P** *Nach Trees.*
- A** *Apple Trees.*
- Q** *Quince Trees.*
- C** *Currants.*
-  *Strawberries.*
-  *Raspberries.*
- G** *Gooseberries:*
- }** *Grapes.*
-  *Asparagus.*
-  *Flowers.*
-  *Lawn.*
-  *Cultivated.*

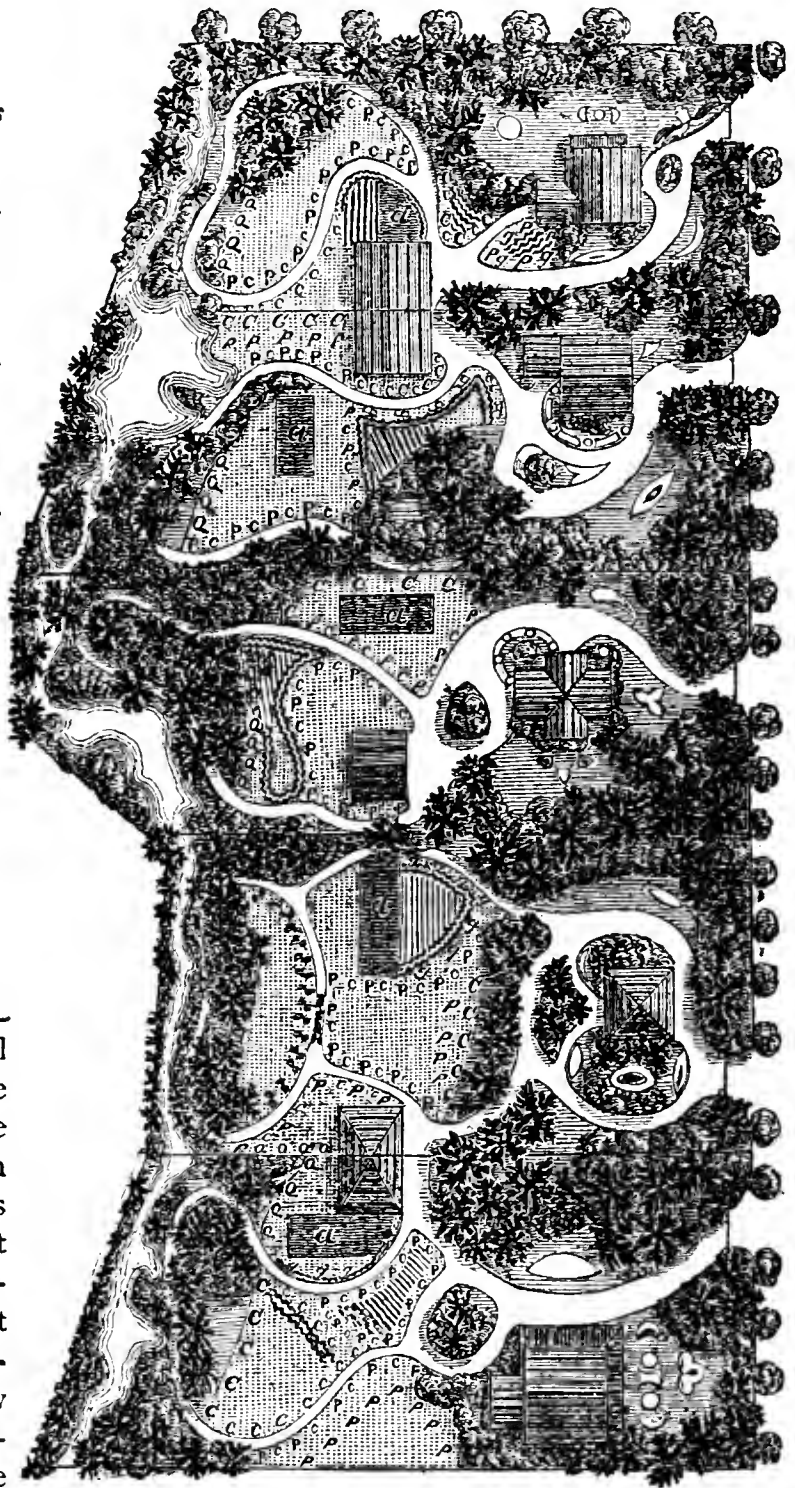


Fig. 1.

without the general consent; and as there is always likely to be some crooked person among men, who does not find his interest or inclination coincident with the rest, it would have been difficult to bring the low land into good condition. But by the substitution of water for marsh these lots became more desirable than those which had no water within their limits.

An examination of the treatment of the shores, and the planting proposed for the banks of the artificial water, will show that I tried to increase as much as I could their variety, and to give the water in each lot some chance peculiar to itself.

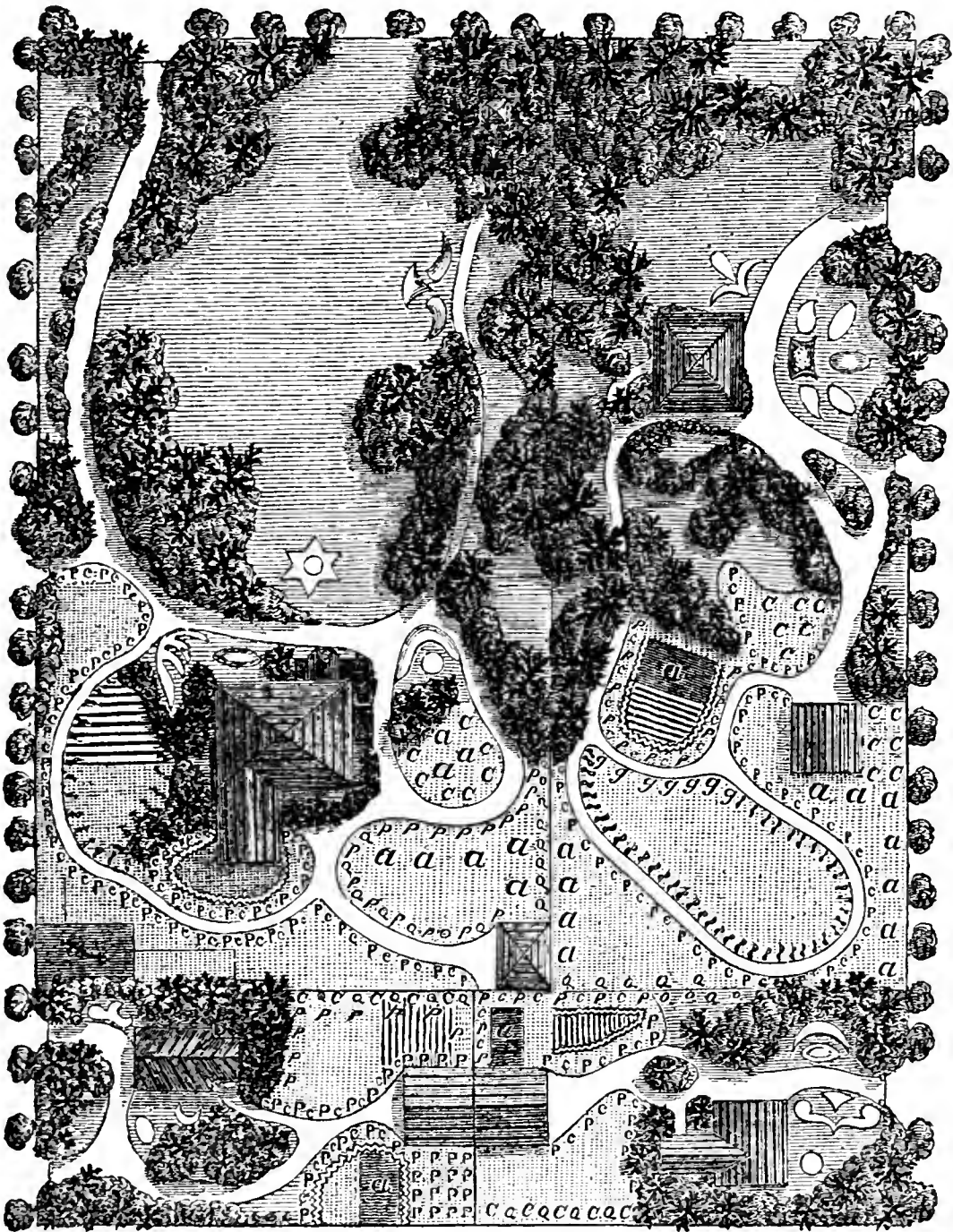


Fig. 2.

In No. 1, the path leading from the kitchen garden takes one through a grove of evergreens, where he would lose sight of the practical features of the garden, and come by a sudden turn and a slight descent to the banks of the brook; following the brook fringed with shrubs, as the path turns to reascend the slope, one would get a view across the pond of No. 2, and just see its outlet hidden among trees.

In No. 2 this treatment is practically reversed, the path for the house taking us directly by the shores of the pond, thence along its banks to a thick grove of mixed trees near its outlet, and then returning, passes through the kitchen garden to the house.

No. 3 gives an opportunity for dense planting, and on leaving the garden we should enter a wood, follow a woodland brook broken into several small falls, to the shore of the pond, which is heavily fringed and shaded with trees; from this point we could return either through the kitchen garden or near the pond of No. 4, and north of the barn.

No. 4 resembles No. 1, with a difference in plantation, and a change in the arrangement of kitchen garden.

No. 5 is unlike all the others. The water having a mixed pond and brook character, the plantation is varied accordingly, and is thrown more into groups, so that the visitor would get a varied, because occasionally interrupted view.

Following the land back from the water we come to the kitchen gardens, which are laid out differently, though in all, the fruit trees and shrubs are valued for ornament as well as use—in some cases they are grouped; in others they border the walk, both for shade and convenience.

In small places every object must be made useful as well as beautiful, and while we cannot claim for a pear, cherry, peach or apple, as much of form and beauty of color through the year as is the attribute of the elm, the maple, the hemlock, pine or spruce, they are not ugly trees. Their fruit compels us to treat them in a different way from purely ornamental; they must be pruned and shaped, and kept regular and compact. But their blossoms are beautiful; no tree equals the apple in floral beauty, and could we let the apple grow into the picturesque shape it takes in the hedge row, it might be commonly introduced as an ornamental tree. But unfortunately for picturesqueness, the apple tree best for fruit resembles a cabbage in shape, while the pear should be trained into a solid triangle; the peach bears best when pinched and pruned into a globular form; the cherry alone can be left to itself. But for flowers in the spring the kitchen or fruit garden may challenge the lawn and grove. Peaches, pears, cherries and apples give a succession of fragrance and color for several weeks. If, in planting a small kitchen garden, we set the trees in groups, they will exhibit what beauty they have to the best advantage, while they are equally well placed for cultivation and fruit.

In the kitchen garden fruit trees should generally border the walks, as in such position they are more easily managed without interfering with the crops which occupy the rest of the land, and their roots can fill the land under the walk. Between the trees we may set currants, gooseberries, or even raspberries. When it is desirable or necessary to mask an ugly building, fill the bend of a walk, or to give solidity to the apex of a triangle between the paths, fruit trees can be planted in regular groups. I use the word regular to show that they must stand at suitable distances from each other, in order to give the roots and branches of each individual tree sufficient room. On the other hand, a group of ornamental trees may be planted without regard to the perfect development of the specimen tree, as we look in such groups for particular effects of form and color, which are sometimes

best produced by bringing the trees close together, and at others by separating them widely.

Passing out of the kitchen garden, in the plans we are discussing, we come to the barns. The barns are joined whenever possible, to take up less room and make it more easy to conceal them, as the same plantation which covers one barn helps to screen the other.

The houses are supposed to be of different size and style of architecture, and are about the same general distance from the main road, but are placed on different sides of the lots, to show that there is no necessity, as is frequently supposed, of setting the house in the middle of one's grounds. As they stand they are parallel to the street, which in small places is generally desirable, as a house which stands at an angle to the street is apt to look awkwardly. The position of the house is of comparatively little consequence when the grounds are reasonably extensive, as good groups of trees and shrubs, and proper treatment of the avenues and paths, will withdraw the attention from the relation between the fixed lines of the house and the street, and it often happens that houses not parallel with the road become most effective when skillfully managed. The situation of the house and barn generally decides the position and number of avenues.

The main avenue to the front of the house is properly called the approach ; it should not be less than fifteen feet wide, and should follow some easy curve. After it leaves the front door it may bend round upon itself, leaving a circle or oval of grass and shrubs as a guide to the horse and wheels, or it may return to the road. The latter treatment I particularly dislike, unless it be for a doctor's or a public house, where coming and going will naturally be in both directions, and where convenience is of more consequence than effect. Such a semi-circular avenue cuts off a piece of land which it converts into a kind of island of little value either as lawn, grass plot or shrubbery.

From the approach near where it turns upon itself, an avenue diverges to the barn and to the rear of the house ; this road need not be more than twelve feet wide, and should follow the line of greatest convenience without especial regard to its own effect.

From the avenue and the approach, paths will lead one to the kitchen garden, lawn, &c. Paths are mere conveniences, and should never be made unless they are really wanted. A lawn cut by a path which can be seen, is reduced in size and grandeur, but trees and shrubs and flower beds decorate the lawn, and may be considered essentially a part of it. A path is a harsh line, which divides, without adding anything to the beauty of the lawn, and convenience alone excuses it.

It will be observed in these plans that I have carried these paths only where the management of the place compels men to go to do their work, and to visit the places they would naturally wish to see ; it may seem that I may have had less in some of the kitchen gardens, as in No. 4 and 5, but I think a study of the plan will show that ease of access to all parts of the garden is increased by the cross paths, which at first seem superfluous.

The situation of the flower garden will be governed largely by the tastes of the proprietor. I have introduced about the same amount into each place, but, as will be seen, the flowers are to be cultivated in beds in the grass, which can be omitted at will, and the grass occupy their places, without injury to the general plan. I think every country place requires a good many flowers, and to sacrifice them in order to increase the land which can be devoted to cultivation, or to save expense, is poor and blind economy. We should show, by our culture and love of flowers and ornamental shrubs and trees, that we recognize that there is a value in beauty which cannot be measured by money. Fruit and vegetables we can buy if we never grow any, and if we devote all the area of our country home to beauty, it will prove a wise investment. We may carry a supply of food for a week in a basket, but nothing can be brought or carried which will replace the effect of well grouped trees and shrubs, or a richly colored flower bed in our lawn or by the side of an approach. I should be sorry to say anything to discourage any man from cultivating fruit and vegetables, but if either the useful or the beautiful must be sacrificed in the country place, I would let the useful go as the least valuable and easiest replaced. But I think I have shown in these plans that there is room for both.

I have thus far described the first five lots, (fig. 1,) which are of nearly the same size, containing about 27,000 square feet. Nos. 6 and 7, (fig. 2,) which contain about 18,000 square feet, though smaller, are treated in the same general manner, although, of course, there is less room for variety. No. 8 occupies 52,000 square feet. With the increased size I have given a different arrangement, varying from the small lots rather in the size of the parts than in the introduction of new features. A path might be carried from the barn along the eastern boundary, to stop at a summer-house in the southeast corner of the lawn, or to continue along the southern boundary to the approach; in the latter case it should be well massed by plantation. I have not shown any such path, because I do not think it is necessary.

No. 9 is nearly two acres in extent. I have set the house near the northern part to increase the apparent size of the place. By massing the house, kitchen garden and stable together, we give a wide space for the lawn, which, with its plantation, becomes as it should be, the main feature of an ornamental country place.

Nothing is more beautiful than well combined or contrasted grass and trees, and a great deal should be sacrificed to secure all of that kind of beauty which is possible. Besides the absolute charm of the lawn, it is simple, and when once made, easily maintained; a well made and planted lawn will, at a trifling annual cost, increase in beauty every year; whereas, flower beds, flower gardens, and all the fugitive charms of nature are a constant or recurring expense.

To secure the large lawn of No. 9, I have carried the approach between the house and the lawn, which I think not desirable when it can be avoided. The house should be so surrounded or connected with the lawn that it

would seem to grow out of it ; when separated, neither lawn nor house can have their best effect. But I have avoided a very common mistake, that of carrying the avenue around the house, thereby making it an island in a river of gravel. Unless compelled by some imperative cause the house should be connected with some of the retired parts of the place, to which access is had only by private paths, to which strangers or the public would commonly have no access.

I have now, in a general way, described and discussed the principal features of a small country place, excepting the plantation, which is the crowning beauty and the most difficult part of the work. How a place is planted is the test of the skill of the artist. No paths, lawn, flower-beds or other decoration, will make up for badly selected or badly grouped trees and shrubs.

Among the many mistakes men make, none is more common than a tendency to overplant small places with trees, making too dense a shade, and preventing a proper proportion of other improvements.

To avoid this, second sized trees and shrubs should be substituted for trees—introducing a few large trees only where shade or concealment of unpleasant objects is desired. The variety and number of small trees and shrubs is so great that there need be no lack of material, and as they blossom at different seasons, more beautiful groups may be made with them than with trees. In large places shrubs and low trees should fringe the plantations, and fill the curves and bends of paths, and be used to bring out points or continue outlines, much as a lady develops her pattern in worsted work, by a filling of some uniform color.

Trees and shrubs are too often planted in rows and formal lines. I have already referred to the value of variety in all the details, whatever the size of any estate may be, and in nothing is this of more consequence than in the plantation. Nature abhors stiffness and regularity ; every group or woodland edge which we admire will be found upon examination to be made up of mixed trees and shrubs which grow at various distances from each other. There will often be in a space ten feet square twenty varieties of shrubs, or half a dozen trees, and in the next ten feet only one or two. By this irregularity the best natural effects are produced, and while we can never hope to imitate nature entirely, we may approach her if we will follow her methods.

When we plant trees and shrubs we should do it by no haphazard method, but carefully consider on a proper plan, what outline and size we would give our group, then see how it may be made, where each kind of tree or shrub is to stand to give the effect we have in mind ; then plant in the ground the same trees and shrubs which were found on the plan to be satisfactory.

Nature is ever ready to lend her aid, and however injudicious we may have been in the selection of form of group, or materials to fill it, if we have been careful to give a bold and irregular outline, and a good variety

of species to the plantation, nature will come to our aid, and in time produce an agreeable result.

Trees are too often planted with no regard to their value as color in making the light and shade of the landscape. The planter should use his trees as the artist does his colors; evergreens are the dark colors, deciduous the light. There is also a great difference in the relative color of the individuals which comprise these two classes of trees. Some of the evergreens, like *Abies Menziesii* and *Pectinata*, have silvery under surfaces to their leaves, which give the trees a light and sparkling effect, while others like the white or Austrian Pine, are a deep blue or yellow green, and some of the Spruces are almost black.

The deciduous trees differ quite as much in color. We may pass from the purple Maple and Beech to the yellow green of the Acacia and Locust, or the white leaves of the Abele, and as the colors of the foliage of trees varies no more than their form, we can, by grouping trees according to their color and shapes, produce any effect we wish.

The more we study natural plantation, the more plainly we shall see how difficult it is to produce the best effects, and also how large a field of inquiry and practice it opens to an earnest and thoughtful man; the only limit is the size of the place which is to be planted, and a life devoted to the study of the possibilities which the form and colors of trees offer, will find one at its close, still learning new effects and unable to equal nature with our utmost efforts.

I must leave the subject here, trusting that the arrangement of the groups of trees and shrubs in the plans which I have given as illustrations to this article, will answer any questions which for want of time I must neglect.

DESIGN FOR A DWELLING.

By B. W. STEERE, Adrian, Michigan.

AS WILL BE SEEN, this design is not for a large or expensive house, but of such size as was hoped would meet the wants of the greatest number of our farmers. The rooms can be enlarged or contracted however, without changing the plan, or reversed, so that the house can front in any direction.

The cellar is seven feet clear, and under all but the kitchen wing, divided into three rooms, by four-inch brick walls. Eight inch walls would be firmer and more secure, unless they are quite short—is entered from the kitchen under the hall stairs, and should have an outside door at some convenient place.

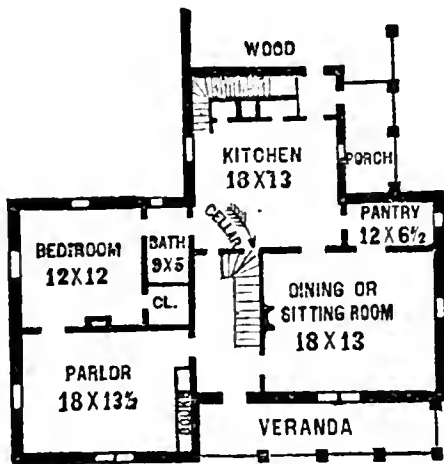
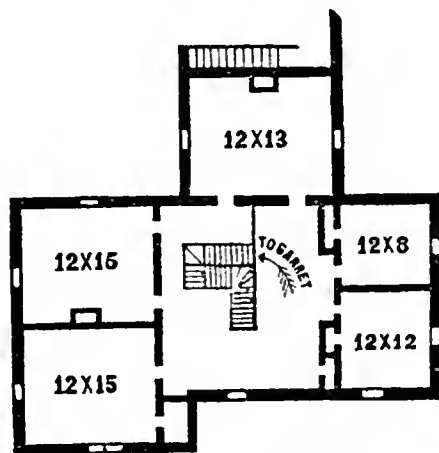
In summer the cook-stove can be placed well back between open windows, for the cool draft, and there should be a large ventilator in connection with

Fig. 1.—*Perspective View.*

the chimney, and as nearly over the cook-stove as possible, and always open in summer.

In winter the stove can be brought more forward, or where a family desires to live particularly snug at that season, the kitchen can be used for storage, and the stove moved into the dining-room, and placed where cellar and pantry will be convenient.

On large farms where a number of hands board in the family, a small cook-room for summer use could be made between the kitchen and woodshed, using present kitchen for eating room, &c. This, however, is not recommended, as it is certainly preferable in all respects to build tenant houses, thus leaving farmers' wives and daughters as free from care and hardship as the ladies of other working classes.

Fig. 2.—*First Floor.*Fig. 3.—*Chambers.*

The hall gives admission to the parlor, dining-room and kitchen, and the bedroom might also be entered from it, through the bath-room, or by making a passage of the closet. The bath-room connects with the kitchen conveniently for hot and cold water.

If more room for stairs is desirable, the hall can be run into the kitchen the width of two or three steps.

Upstairs are four nice bed-rooms, with closets to all, and stairs leading to the garret, which will make a fine room for drying clothes in stormy weather, where they can hang in safety until needed for ironing.

A house on this plan *may* be built of brick, though designed for wood,

that being the material mostly used by farmers in this State. It should, I think, be two stories high, except the kitchen wing—lower story $9\frac{1}{2}$ feet, and upper story $8\frac{1}{2}$ feet, or perhaps 9 and 8 feet clear would do. Tops of roofs to front wings same height, or vary a little, as suits taste. Roofs one-third or more pitch, to project two and a half feet, sealed up plain, or broad ornamental verge board at the gables, and show ends of rafters at the sides.

With the balloon frame, which is perhaps best, and filled in with cheap brick, this house could probably be built for about \$3,000. A neat, *plain* inside finish will be most satisfactory in the end, and stories of moderate height are more comfortable, cheaper built, save fuel, and with proper ventilation, as designed in this plan, quite as healthy as those of 12 or 14 feet, which make a plain farmer feel as though he scarcely has a roof over his head.

There is but little expense in carrying out a complete system of ventilation, if thought of and planned in season. Flues may be carried from cellar to garret in connection with chimneys, or at some other convenient point, into which openings can be made just below the ceilings of all the rooms—swinging sash may be made over bed-room and closet doors, and windows made to lower from the top, &c. A little thought and reading will suggest various other helps towards accomplishing this all important and never to be forgotten point.

PACKING GRAPES FOR MARKET.

MUCH OF THE PROFITABLE SUCCESS OF GRAPE CULTURE depends on packing in the best manner for market. Neat boxes, which open with perfectly kept fresh fruit, with none of the bloom rubbed or defaced, will always sell at a higher price than badly or carelessly packed and injured bunches. We visited last year the packing establishments of two of the most successful grape raisers in the country, and are enabled to furnish descriptions of their management. We allude to those of Oliver C. Chapin and E. M. Bradley of East Bloomfield, N. Y.

The packing house belonging to Mr. O. C. Chapin, connected with a thirty acre vineyard, was formerly a large four-story barn, measuring forty by sixty feet, and sixty feet high at the peak from lower basement. During the busy season, thirty persons are employed for packing. The grapes are first picked and placed in flat boxes, with lath bottoms and strips of lath on two sides,

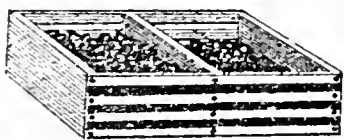


Fig. 1.—*Box for Gathering.* with a partition across the middle for stiffening. These boxes are about sixteen by twenty-one inches inside, and

nine inches deep, but their precise dimensions are not very essential, (fig. 1.) They are commonly filled about one-half or two-thirds their depth, are placed on a long spring wagon drawn by one horse, and without disturbing their contents,

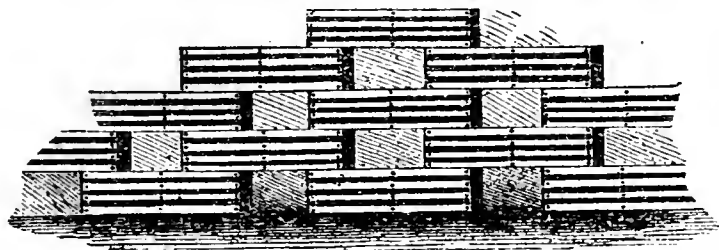


Fig. 2.—*Gathering Boxes Piled for Ventilation.*

drawn to the packing house and placed on a floor made of narrow boards, with wide spaces between, to allow the free passage of air from the open apartment below. The mode of placing them is shown in fig. 2, so as to admit free ventilation. Here they remain two or three weeks, more or less, till packed for sending to distant places. They are mostly packed in round wooden boxes, six inches in diameter and three and a half deep, covered with colored printed paper, and holding about two and a



a half pounds each, (fig. 3.) Twenty-four of these are then placed in a smooth wooden box or case, thirteen by twenty-six inches, and eleven inches deep.

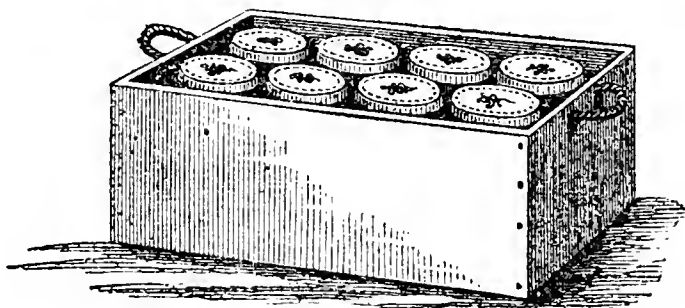


Fig. 4.—*Packing Case with Twenty-Four Boxes.*

Fig. 4 exhibits the appearance of one of these cases when filled, and before the cover is nailed on. Each case holds from sixty to sixty-five pounds of grapes. Sixty thousand boxes were made and on hand at the time of our visit, being enough to hold eighty tons of fruit. They cost about \$6 per hundred, and the sixty thousand were worth \$3,000.

We published in a former number of the REGISTER some valuable information communicated by E. M. Bradley, in relation to marketing grapes, in which he has been eminently skillful and successful. His vineyard occupies eight acres, and is a model of neatness and good culture. His vines are mostly the Isabella, and are trained on horizontal four-wire trellis, 6 feet high and sixteen feet apart. The vines are nine to thirteen years old and ten feet apart in the row. The ground has mostly a natural under-drainage.

The soil was made too rich in the first place, and it is now necessary to plant the spaces between the trellises with beans, carrots, beets and turnips, in order to reduce somewhat the tendency to make too strong a growth of vine. The bunches were remarkably well grown, some of them having weighed a pound and a quarter, and we measured berries seven-eighths of an inch in diameter.

Great attention is given to neat and perfect packing. Round and square

or oblong boxes are used. The round ones are of pasteboard, and hold one and two pounds each. They are handsomely covered with rich colored paper, with gilt tippings and French colored prints or chromos. They cost about twelve cents each, fig. 5. They are used for the very best berries,



Fig. 5.—Round Paper Box.

ries, and are sent to the best markets. The oblong ones are of wood, five and a half by nine inches, and four inches deep, and hold about five pounds of grapes, (fig. 6.) These boxes, when filled with grapes, are heaped or rounded about half an inch above the level of the top; and the berries possessing some elasticity, they pack closely when pressed, and prevent rattling. When filled they are placed in cases or boxes. Fig. 7

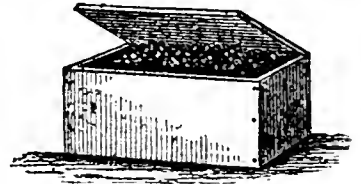


Fig. 6.—Square Box.

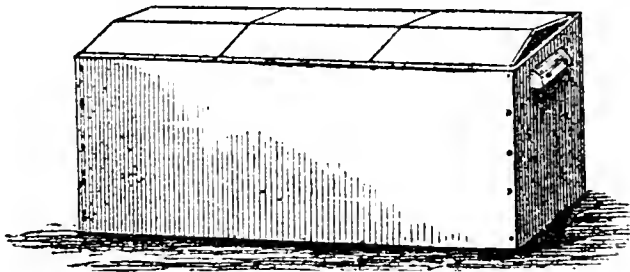


Fig. 7.—Case with 18 Boxes, the lids raised slightly by the rounded packed Grapes within.

represents one of these cases filled with the square boxes, showing the slight elevation of the lids before the pressure is applied. Each holds eighteen boxes, or about eighty-five pounds, and measures about one foot each way inside, and twenty-seven inches long. The round boxes are packed in smaller cases, so as to hold twenty-four each. There is space enough, so that the pressure does not quite bring down the lids of the small boxes, the elasticity of the grapes keeping all snug.

CATTLE TIE.

I GIVE YOU A DESIGN for a cheap, effective and simple cattle tie, which may be new to you or some of your readers. It is preferable to stanchions, as being more humane; while it is always out of the cattle's way, so that they cannot possibly get it fastened anywhere so as to break it. It is easily put on and off.



The leather of which the straps are made should be made wet and *stretched* before using; mine were not done so, and have become a little too long, which we correct by simply twisting one after the other one has been put on the horn.

I use them on my oxen, which stand two in the same stall, upon a raised platform, just long enough for them to stand on, with a gutter behind them to save manure.—J. R. G., in COUNTRY GENTLEMAN.

FRUITS AND THEIR CULTURE.

GROWTH OF PEAR TREES.

THE DIFFERENT MODES OF GROWTH in the varieties of the pear should be well understood by those who would train them successfully, each requiring its peculiar management. Those which have

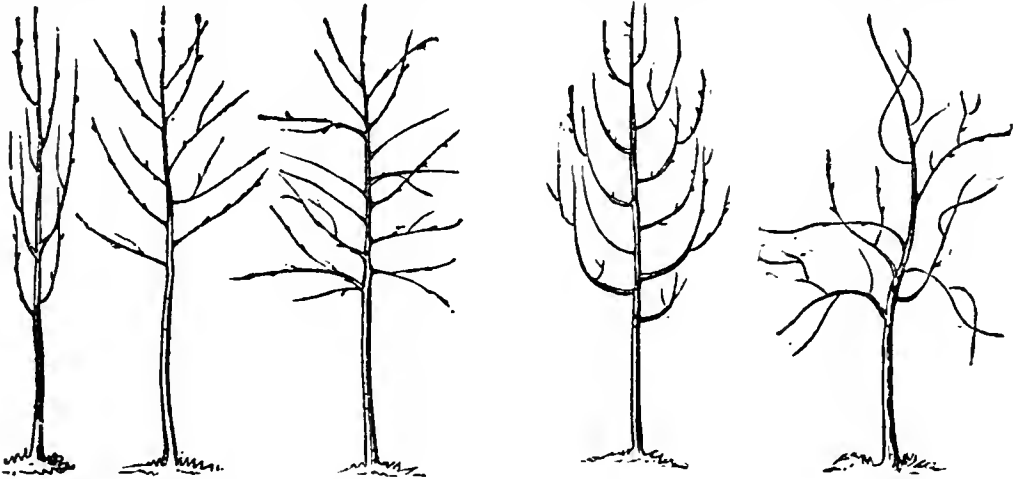


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

a straight, upright growth, (fig. 1,) as the Buffum, and also the Bartlett, although in less degree, should prune them in such a manner as to give them a more spreading form. The upper shoots should be cut back more freely than in other trees; and, in making a cut, let it be done next above a bud which stands on the outside of the shoot. In removing supernumeraries cut out those which are most upright, leaving those which have a diverging tendency, so far as can be done to advantage. It is proper to remark, however, that less care need be taken with the Bartlett and Buffum than with some other sorts which are less productive, as these two are such enormous bearers as to give the branches a diverging tendency after a few years, the great point being to prevent the tops from running up too high.

Those sorts whose shoots are diverging, as in fig. 2, as in the Seckel, Washington and Boussock, do not require the special care just described, but only enough to preserve a handsome, even head.

Where the branches are spreading, as in fig. 3, as seen in the Lawrence, the pruning adopted in the first instance should be rather reversed, by cutting out such shoots as have a tendency to droop, and leaving those of a more straight and upright character. This care is especially required for the lower branches, where horses are used for cultivating the orchard.

Varieties with ascending shoots, or those which curve upwards, as in fig. 4, instances of which occur in the Tyson and Onondaga, require nearly the same care as in the case of fig. 2. They mostly form handsome heads with very little care, except the removal of one-sided branches, and in preserving an even distribution.

Fig. 5 represents the straggling growth seen in the Winter Nelis, Black Worcester and Beurre Giffard. If these sorts are worked on the stocks as usual, near the surface of the ground, they require much staking to make even tolerably straight stems. Much better trees may be made by grafting or budding them at standard height into such straight varieties as the Buffum. In this way, with the addition of keeping the head in good shape, we have succeeded in making handsome trees of this sort.

THREE COOKING PEARS.

There are three varieties of the Pear remarkable for their large size, which have been long famed in market for their cooking qualities. They never become soft for table use. These are the Black Worcester or Iron pear, the Catillac and the Pound—the latter known also as Winter Bell and Uvedale's St. Germain. The first is remarkable for its crooked and strag-

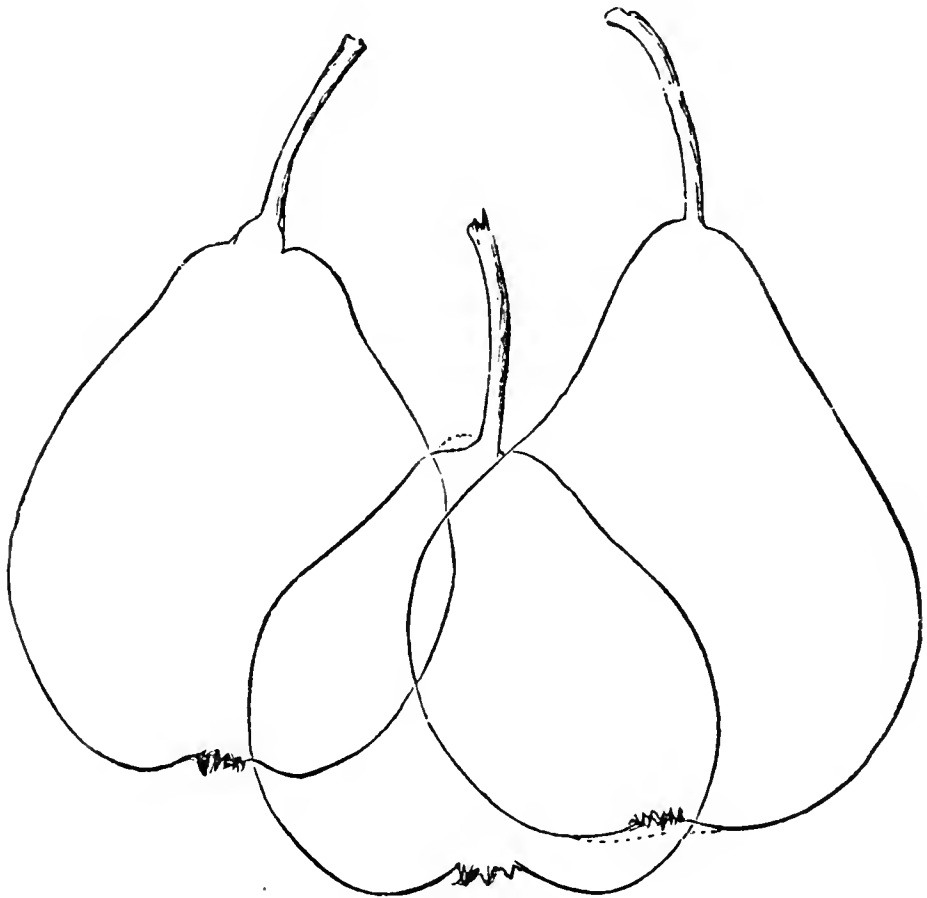


Fig. 6.—*Black Worcester.*

Fig. 7.—*Catillac.*

Fig. 8.—*Pound.*

gling growth, but the tree is extremely hardy and enormously productive, and some old trees in the neighborhood of Boston have proved quite profitable by the sale of the crops in market. The trees of the two other sorts, and especially the Pound, are straight, vigorous, healthy, upright growers. In the outlines of these varieties, which we here give, they are represented as only one-half the diameter of medium-sized specimens.

WINTER TABLE PEARS.

At the present time, no two varieties for early winter use stand higher in public estimation than the Lawrence and Beurre d'Anjou. The latter is an autumn variety, but in a cool room will keep till the first of the year, and is therefore more valued by some as a winter than an autumn sort. Among good winter varieties less noted, we give the outlines of four, reduced

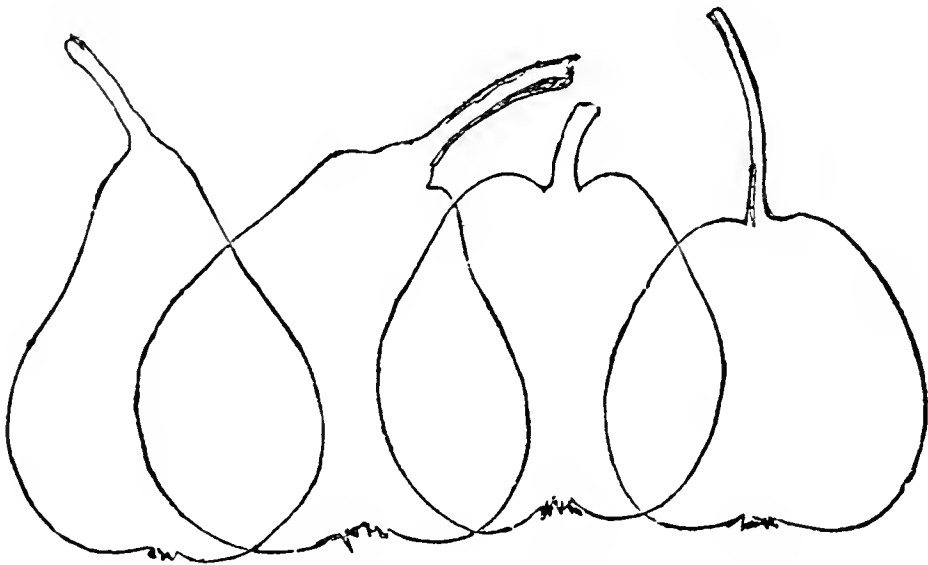


Fig. 9.
Las Canas.

Fig. 10.
Passe Colmar.

Fig. 11.
Beurre gris d'Hiver.

Fig. 12.
Lewis.

to one-half their ordinary diameter. *Las Canas* is sometimes an excellent pear, but as the quality frequently falls below, it has not been much cultivated. *Passe Colmar* is a well-known and excellent variety, but too often allowed to become poor by over-bearing. A vigorous growth should be given to the tree, and the fruit invariably well thinned out. The *Lewis* has not been cultivated much in this country out of New-England, where under good management, it has proved a fine winter pear—the flesh becoming melting, juicy, and of a rich flavor. As the tree is a great bearer, the fruit is often allowed to become small by crowding, in which condition its good quality is not developed. The *Beurre gris d'Hiver* is doubtless the most valuable of the four, and it may yet stand high on the list of winter sorts. Although usually regarded as a winter sort, we have seen specimens three inches in diameter grown under the best management, assuming a high and excellent flavor.

LEAF AND FRUIT BUDS.

Young fruit growers are often at a loss to distinguish between these two kinds of buds. They consequently make mistakes in pruning by cutting away fruit buds when they would retain them, and vice versa. A young tree, for instance, to which it is desired to impart more vigor would only be checked by cutting away leaf shoots, and leaving fruit spurs. They also frequently wish to make examinations after severe winters for ascer-

taining if the crop has been destroyed, by cutting with a sharp knife through the centre of the buds.

Fruit buds are generally distinguished by their rounded and obtuse form ;

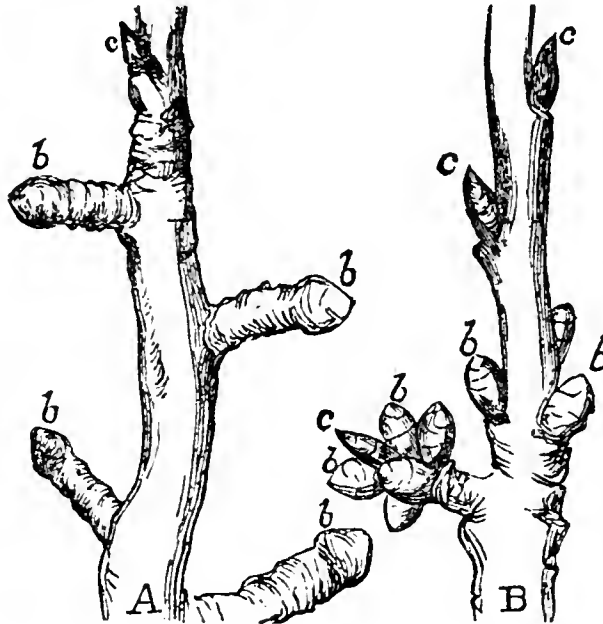


Fig. 13.

Fig. 14.

while leaf buds are slenderer and more acute. In the accompanying figures A. represents a portion of the branch of a pear tree ; *b b b* are fruit buds on the extremities of short spurs ; *c* is a leaf bud, on a one year's shoot. The fruit spurs are nothing more than stunted shoots, originally produced from leaf buds, but which, making but little growth, become fruit bearers. In the pear and some other trees they are never less than two years old, and they often continue to bear for many years. B. exhibits the appearance of the two kinds

of buds as seen on the cherry ; *b b* being the rounded fruit buds, and *c c*, the leaf buds, distinguished by their slender and acute points.

Cause of the Formation of each.—Whatever tends to a free circulation of the sap, and consequently to a rapid growth, causes the formation of leaf buds rather than fruit buds. On the contrary, whatever tends to retard the motion and increase the accumulation of sap in any part, induces the production of fruit instead of leaf buds. Thus, in the examples just given, as soon as small stunted shoots are formed, they become furnished with fruit-producing buds. The vigorous one-year shoot of the cherry (B) is mostly supplied with leaf buds ; but the short spurs on the second year's wood, which are but shortened branches, are covered with fruit buds, with only a leaf bud in the centre.

This also explains the chief reason that young and vigorous trees, whose wood and bark are comparatively soft and yielding, and through whose large and unobstructed vessels the sap flows without restraint, do not bear so freely as those whose older and more rigid parts impede the circulation. A young tree kept in a very thrifty condition may not produce fruit buds for many years ; while, if checked in its growth by imperfect culture, it will bear at a much earlier age. Some free growing varieties, as the Bartlett pear, from a constitutional peculiarity, will bear at one-third of the age required for others, as the Dix and Tyson.

GRAFTING LARGE STOCKS.

Young operators are sometimes puzzled to know what to do with stocks which greatly exceed the graft in size. In order that the line of separation

between the bark and wood may coincide in both, the graft must be placed at one side of the large stock *a*, sloped and tongued for the reception of the graft *b*, their union being represented by *c*. (Fig. 15.) To facilitate the wrapping of the wax plasters, one side and the upper point of the stock are pared off with a knife, before the two are joined, as shown by the dotted line. This is a good mode of grafting any stocks not over three-fourths of an inch in diameter, in the nursery row.

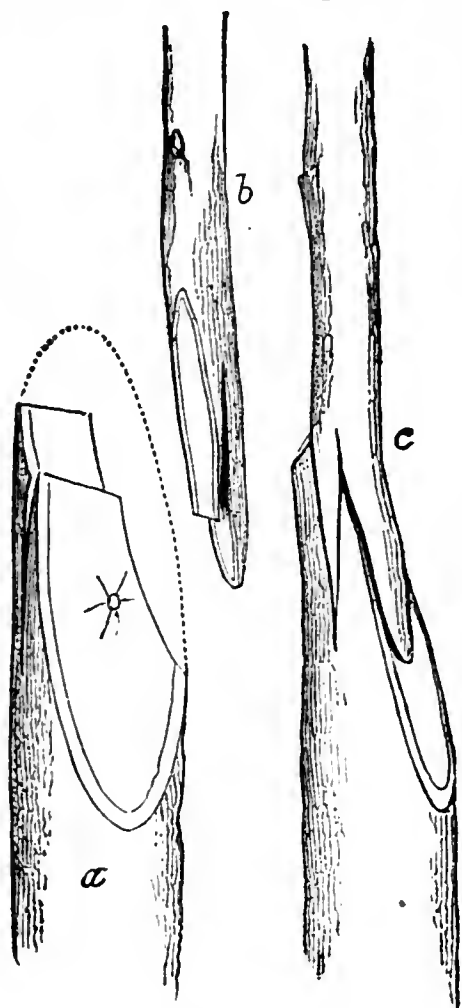


Fig. 15.

keep cutting if necessary. Cultivators sometimes remark that they have tried this remedy and failed. On inquiry it has generally appeared that they allowed it to spread weeks, or even months before the knife was applied, and then perhaps only a single excision was performed. Keep the eye and the knife ready at all times, and little trouble need be feared.

BLACK KNOT ON THE PLUM.

This disease, which is now generally admitted to be caused by an internal fungus bursting through the bark, like the rust in wheat, is regarded in some places as the greatest difficulty in the way of plum culture. After twenty-five years' experience, we find less difficulty in keeping our trees free from this disease, although it often makes its appearance, than in eradicating weeds from the soil. It is only necessary to watch the trees closely and cut away freely on its first appearance.

Fig. 16.—*Black Knot.*

THE APPLE WORM.

This insect is becoming more formidable of late years in the eyes of orchardists than any other insect with which we are troubled. In many regions of the country it is disfiguring most of the apples intended for market, and vast sums are yearly lost in that way. Dr. Trimble succeeds in destroying large numbers by wrapping the trunks two or three times around with hay rope, early in summer. The insects hide under the rope and are afterwards killed. This is a useful mode of destroying them, but it would hardly answer for extensive orchards, and a part of the insects escape. Turning in swine, which eat the fallen fruit, and thus destroy the

worms, has been found to answer an excellent purpose, and give crops of fair fruit. But few farmers have swine sufficiently numerous for a large orchard, and sheep have therefore been proposed as a substitute. In the few instances in which they have been tried, we believe they have proved quite successful, but more experiments are needed. They rarely gnaw the bark in the summer season, but all danger may be prevented by rubbing the trunks with blood—refuse meat or liver from the butchers may be employed for this purpose, and will answer as a repellant for some weeks.

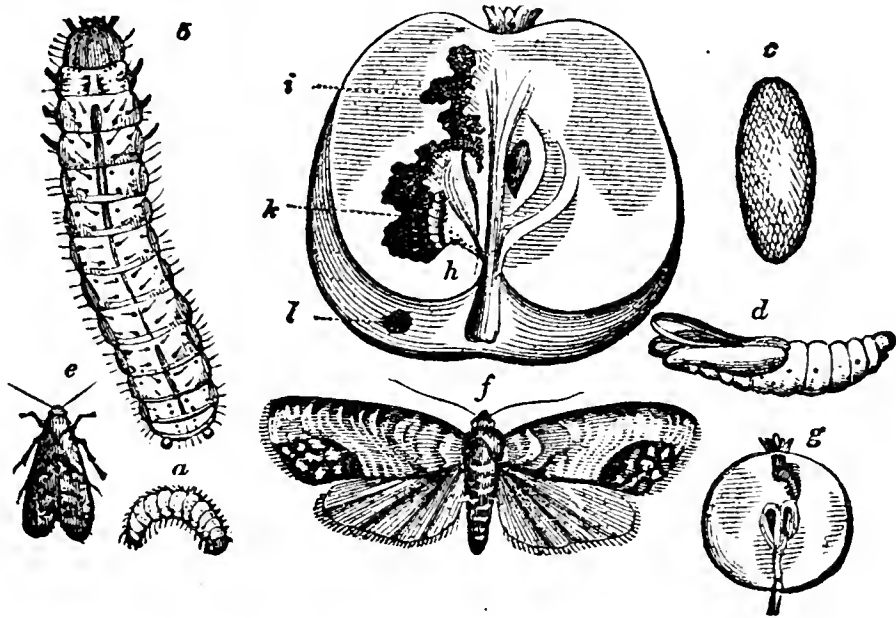


Fig. 17.

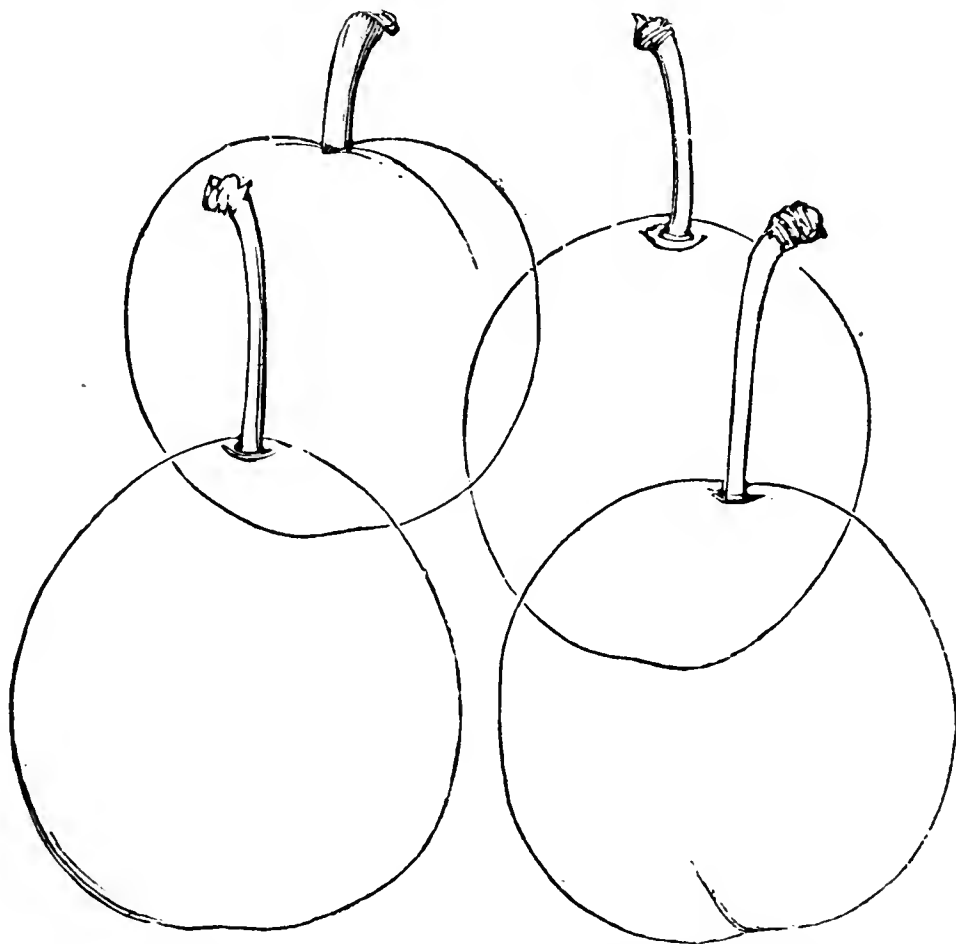
The above figures (fig. 17) exhibit the apple worm in its different stages; *a*, the larva; *b*, the same magnified; *c*, the cocoon; *d*, the pupa within the cocoon; *e f*, the perfect insects; *g*, the young larva, just hatched, after having been deposited within the calyx; *h i k l*, the progressive work of the larva within the apple, till it escapes.*

FOUR GOOD PLUMS.

The accompanying accurate outline figures, drawn carefully from the specimens, represent four good varieties of the plum suited to amateur cultivation. The trees are not sufficiently vigorous and productive for market purposes, but they are worthy a place in all large collections. The *Early Royal*, or *Royale Hative*, is quite early and of medium size. The skin is of a soft light purple, and the flesh amber yellow, with a rich high flavor. The shoots are very downy. It considerably resembles the *Purple Gage*, but is some weeks earlier. The *Re Gage* is well known to fruit growers for its sprightly and its pleasant and refreshing flavor. It hardly comes up to medium in size, has a brownish red color, and has a juicy and melt-

*The curculio or plum weevil, when very numerous, attacks the apple, and its peculiar crescent-shaped incisions may be perceived on the skin of tender varieties. The larva, however, rarely reaches the core. But the apple worm never attacks the plum, which has no permanent calyx for the lodgment of its eggs.

ing flesh, quite free from the stone. The *Purple Favorite* is considerably larger, is brownish purple in color, and has a greenish flesh, juicy, melting, sweet and rich, free from the small stone. It ripens about the first of autumn. The growth of the tree resembles that of the Red Diaper. The *Royale* follows the *Purple Favorite* closely in ripening, and is about the same size; it is reddish purple, and has a rather firm, juicy flesh, with a rich, excellent flavor. The shoots are very downy.

Fig. 18.—*Early Royal*.Fig. 19.—*Red Gage*.Fig. 20.—*Purple Favorite*.Fig. 21.—*Royal*.

With these four varieties a supply of very pleasant table plums may be kept up for about a month.

DRYING PRUNES.

Much inquiry having been made of late years, especially where the crops of plums have been abundant, of the best mode of preparing prunes, we copy the following from Siegel's Treatise, giving an account of the French and German process:

"In order to have them fair and glossy, they must be *suddenly cooled*, when withdrawn from the oven.

"The country people in this part of Germany, prepare their prunes by putting them into their bread ovens. I have put up, for my own use, a very conveniently arranged drying apparatus, which, after the experience

of many years, I am induced to recommend ; and for the construction of which I give the annexed drawing and explanatory description.

“The vault or exterior of the oven, four and a half feet long, is surrounded by a brick wall one foot thick, so that the whole stove, *a b c d*, (figs. 22 and 23) is exactly six feet every way ; the front wall, *n*, being only half a foot in thickness. At the top, the vault is arched over with six inches of brick work at the crown of the arch. The flues *i i*, are about fourteen inches square. The hurdles or trays, *m m*, for containing the prunes, rest upon shelves fixed upon two bearers. It would be better if they rested upon *rollers*, so as to admit of their being pushed in and drawn out, with greater ease. These lines of trays are placed at a distance of six inches from the furnace, so as to keep the

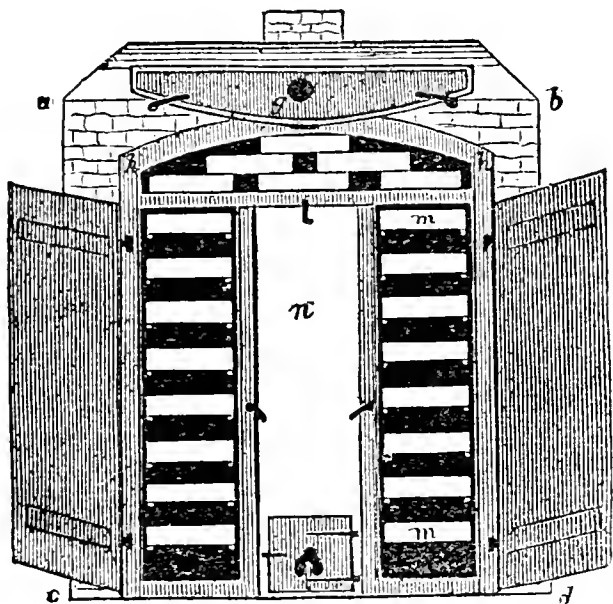


Fig. 22.

fruit from too great a heat ; they may be made entirely of wood, but it will be better if the bottoms are of open work, like sieves. Their weight is such that they may be easily managed by a woman ; but in preparing prunes on a large scale, let them be made of greater length and breadth, so as to just come within the strength of a more robust person.

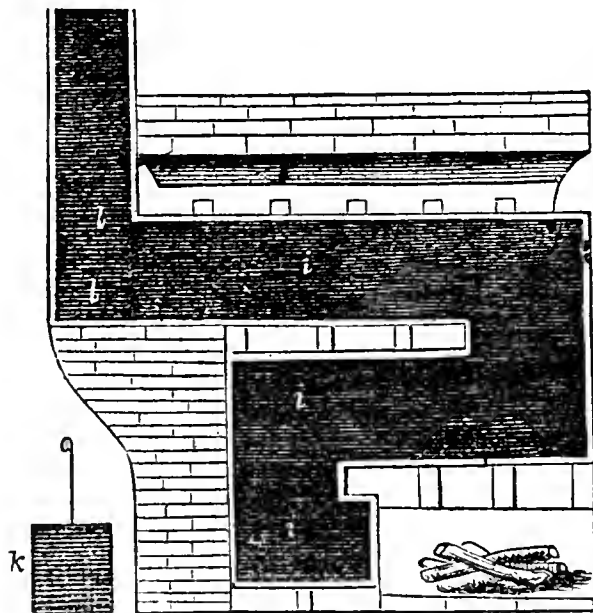


Fig. 23.

“A thousand fully ripe Quetsches, (prune plums,) make about ten pounds of dried prunes.

“Plums of different kinds may be dried, either whole or deprived of their

skins and stones. In the latter case they are styled *prunelles*. When the White Perdrigons are used for this purpose, they are merely stoned without skinning; the latter, from the delicacy of their skins, not being deemed necessary.

“For *prunelles* perfectly ripe and sweet plums are to be taken, and suffered to wilt a little in the open air in order to facilitate stripping off the peel. A better and more expeditious way is to pour hot water over them, and suffer them to steam a few moments.

“The stone is pressed out at the stem end. In the drying ovens, these prunes must be very carefully and gradually dried. They may also be dried, but not so easily, in the sun.”

VARIETIES OF THE QUINCE.

The two outlines here given, show, in a reduced form, the two principal old varieties of the quince—the round representing the Orange or Apple variety, and the other the Pear quince. The trees which are found throughout the country have in many instances, been obtained from seed, and hence present a considerable variety of form, with less of quality. Rea's Seedling or Rea's Mammoth is a very large and improved variety of the Orange, being one-third or one-half larger and of excellent quality. The tree is a strong grower, with large foliage. The Angers quince used for pear

stocks, bears a fruit similar to the Orange in appearance, but is a little later, and slightly harder in texture. The Fontenay or Paris quince does not bear so good a fruit as the Angers, but more resembling the Pear quince in form and texture.

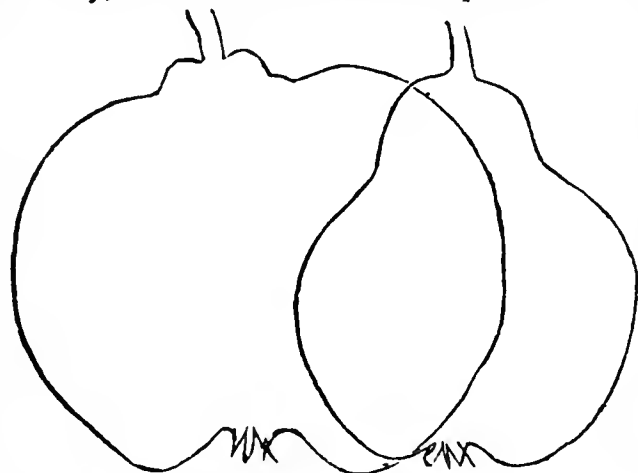


Fig. 24.—Orange Quince. Fig. 25.—Pear Quince. stocks, bears a fruit similar to the Orange in appearance, but is a little later, and slightly harder in texture. The Fontenay or Paris quince does not bear so good a fruit as the Angers, but more resembling the Pear quince in form and texture.

PRUNING THE DELAWARE GRAPE.

F. C. BREHM of Waterloo, N. Y., states that the greatest difficulty he finds with the Delaware grape is its liability to overbear—thus permanently injuring the vigor of the vine, and giving an immature and partly insipid fruit. Four years ago his Delawares first came into general bearing. He trained them on the horizontal arm and renewal system, leaving the upright canes when pruned about five feet long. When these bore they had an immense crop. He cut out nearly one-half of the clusters, but still they overbore, and have not got over the effects of it to this day. The next year he cut the canes back to thirty inches, but still they overbore. Then he cut back to twenty inches. In 1866 he cut still closer, with the same trouble—an overcrop of unripe fruit. Last fall he cut them back to three buds, and he now hopes to get some good, well

ripened grapes, and not be overtasking and killing his vines. He says there is an immense number of vines ruined by leaving too much bearing wood and permitting over-bearing, inducing mildew, rot and other diseases, besides getting poor fruit in the eager desire to have a big crop. He further gives his opinion that the defect in the growth of the Delaware, some years ago, was owing to the enfeebling of the vine by over-propagation—an evil now resulting to some of the newer sorts, by the use of immature wood, green cuttings, and anything that will produce a plant.

IMPROVED STRAWBERRY IMPLEMENT.

The greatest labor in tending the strawberry, is in keeping the runners cut or broken off, as they have to be severed a number of times during the season.

The implement shown (fig. 26) is designed to aid the strawberry culturist in this part of his work. It is made as follows: A handle, (an old hoe or rake



Fig. 26.

handle will answer,) with slit sawed in as shown. B, circular steel cutting blade 5 inches in diameter, with sharpened edge, and one-quarter inch circular hole in centre. Arrange it within the end of the handle.

Operation.—Select a dry time when the ground is hard, and the runners will soon wither when severed from the parent stock. Run the blade half round the hill, with a slight pressure; enough only to cut the runner—two strokes should always clear a hill from runners. A rapid workman can clear 18,000 hills per day, which is 10,000 more than could be done in the old way—pinching them off—and will be found far easier to the operator, for the simple reason that you sever with two strokes all the runners on a hill; which by hand would require as many movements as there are runners, besides always in a bent position. With this implement it is the reverse. A small bolt should be used for the axle, and by tightening it the blade becomes stationary, and can be used to remove the plants, and for various other garden operations.—L. D. SNOOK in CO. GENT.

A MAGNIFICENT ORCHARD

The celebrated Baldwin orchard of Oliver C. Chapin of East Bloomfield, N. Y., is one of the finest young plantations in the country. The trees are mostly seven or eight years old, and have scarcely yet come into bearing. The great extent of these plantations which occupy a gradual slope to the south and east, gives the grounds a rich and magnificent appearance when seen from a distance of a mile or two; and the six thousand luxuriant apple trees, viewed from certain portions seem to present a sea of verdure.

These orchards are kept well cultivated, with the ground mellow and clean, without any other crop. They are plowed twice in the season, about

four inches deep, and harrowed several times. Some think it a waste of land not to raise any crop among the trees ; but the owner looks at it in a different light. By his treatment he thinks each growing young tree is increased in value at least one dollar yearly, even if it bears nothing ; and the trees being thirty feet apart, or fifty to the acre, he receives a return in increased capital at least fifty dollars per acre, or \$5,000 annually on his hundred acres of young orchard. There is no question that this is a moderate and fair estimate, and that the trees, when they come into full bearing, will give a profit much greater than this calculation—unless the productiveness of trees, which has existed for centuries, should suddenly fail, which is not probable. In plowing, care is taken not to go too near the trees, and the small unplowed portion is inverted once a year with the spade. When this spading is regularly kept up, it is easily repeated, and one man will go over two to three hundred trees in a day. It is done in autumn. The borer has given some trouble, but care is taken to go over the orchard, and destroy it before it has made progress—one man who is accustomed to the work clearing several acres in a day.

STRAWBERRY MARKETING IN NEW-JERSEY.

By EDMUND MORRIS of Burlington, Author of "Ten Acres Enough," &c.

THE PURCHASERS at fruit stands in the city markets have noticed that their favorite cultivated berries are measured out to them in little wooden boxes or baskets, holding some a pint, and others a quart. But coming for the fruit only they take but little heed at the shape or fashion of the vessel in which it reaches market. Yet a moment's consideration of the vast quantity which finds its way to the great cities, would satisfy any one that the business of supplying these small boxes and baskets to contain it, must be a very large one. As the subject of supplying boxes is now a leading topic with fruit growers, as well as inventors, some details of proceedings in a fruit-growing region will doubtless be interesting to many readers.

The visitor to this portion of New-Jersey, when riding over the carriage roads, will observe in numberless fields that certain little temporary sheds have been set up, generally made by sinking four posts into the ground, connected by plates extending from post to post, on which rests a rough board roof, hardly tight enough to turn water, but sufficient to exclude the sun. These structures are set up in an hour or two, and can be as quickly taken down when necessary to remove them to another field. They are known as strawberry sheds. In picking time, here stands the proprietor or his foreman while the crop is being gathered. He hands out the empty boxes to the pickers, and if a careful man he will have provided light wooden

trays (fig. 1) for each, holding two or four boxes, with a handle for convenience of lifting the tray. The pickers sally forth, and two will generally

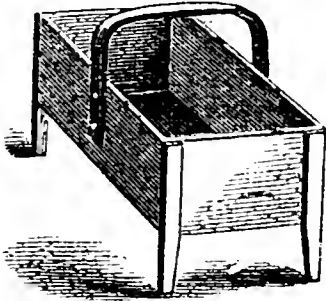


Fig. 1.—*Picking Tray.*

appropriate a row of plants, each picking on one side until finished. When the boxes have been filled they return them to the foreman under his shed. He carefully examines the contents, seeing that the boxes are full, and that they contain no unripe or imperfect berries. This done, he delivers to each picker as many tickets as he may have returned boxes, and the latter, supplying his tray with empty ones, departs to fill them. The foreman then deposits the full boxes in a chest or crate, and continues to do so until filled, when he fastens down the lid, and lifts it into a spring wagon waiting to receive it. The picking begins as soon as the dew has dried off, and thus continues until the entire ground is gone over. When the field is an extensive one, employing twenty to forty pickers, the foreman is kept busily engaged in inspecting, packing and labelling the chests with cards containing the name of the agent who is to receive and sell the fruit. When the wagon is found to be loaded, it is driven by an assistant to the freight station. The picking over, the motley crowd of women and children step up to the captain's office to be settled with. Each presents his tickets, and the foreman having provided himself with small change for the occasion, promptly counts out the exact sum due to each. The crowd goes straggling back to town with audible rejoicing over the ample pay which all have earned. A smart girl will readily pick a hundred quarts of strawberries per day, for which she receives two dollars, sometimes two and a half. At this rate of compensation for that class of help, there is very rarely any difficulty in obtaining the necessary number of pickers. In fact, the fraternity of fruit pickers is a large one. They look forward to the berry harvest with almost as much anxiety as the berry grower himself. Should the crop fail, the failure falls heavily on the pickers, some of whom depend upon it for paying rent and procuring clothing.

In this location the picking generally closes at about five o'clock P. M. A train of empty freight cars leaves Camden, opposite Philadelphia, in the morning, and comes creeping up the Amboy railroad to Jersey City opposite New-York, stopping at every station to receive the collected consignments of fruit and truck which have poured in from a circuit of several miles around—each basket, crate or barrel labelled with the consignee's name. About six o'clock it reaches Burlington, thus giving us a good long day in which to complete our picking. The quantity of fruit and other articles thus daily gathered at this station is truly wonderful to behold. One of my neighbors has repeatedly sent 200 chests of strawberries to market daily, each containing sixty quarts. Another has forwarded enough in one day to produce him nearly \$3,000. Long before midnight the now crowded train arrives at Jersey City, where its contents are ferried over to New-York. While the gas-lights are yet burning, our agent is at

the landing with his wagon, looking up consignments from his various friends. Buyers also are there from all quarters of the city, and speculators who buy from first hands to sell again, all competing for the first choice at the best fruit. The crowd and jumble is tremendous, and the whole scene a very animated one. All the choice fruit is disposed of on the spot, as well as much of the inferior. Well known brands of growers who never send an inferior article to market, are sought after with avidity, and are bought without examination. They command the highest prices and a rapid sale.

It will be understood that New-York is not the only market accessible to the fruit growers of this vicinity. While that great city is within three or four hours of us, there is a population of a million in and around Philadelphia, within one hour's travel by rail, and an hour and a half by several steamboats. In forwarding his produce, the farmer thus has choice of the two largest markets in the Union. But in addition to these the large canning establishments which have sprung up around us will purchase entire crops of all kinds of fruit. They also absorb vast quantities of asparagus, sweet corn, pickles, peas, beans, peppers and tomatoes, and give employment to hundreds of women and girls in putting up these various articles. These establishments have become so numerous as to be a very perceptible sustaining power in the fruit market, preventing the gluts of former years, by distributing the consumption of a dozen sorts of crops over the entire year, instead of crowding it, as aforesaid, into the ripening season only. They constitute our third market. The fourth is at our railroad station, where, when fruits and trucks are first coming in, dealers from abroad will be found on the platform, prepared to pay cash for any quantity of seasonable products. The choice of markets is thus a wide one, and cannot be excelled. The difficulty is not where to find sale for what we produce, but to produce it in abundance, and of superior quality. As a general rule the inferior article pays little or no profit. The strawberry crop of 1868 afforded none worth having. It was probably the least remunerative we have ever had. There was an excess of heavy rain while it was ripening, too much ground was planted, and consequently no proper cultivation was given to it. Everything, however, can be overdone. Many have yet to learn that one acre assiduously attended to will pay better than ten neglected ones.

The chests and boxes are, of course, delivered with the fruit. A stranger purchasing is required to deposit a sufficient sum with the agent to guarantee that he will return them. They thus become scattered all over the city and country. There is a body of speculators in berries who are known as "shippers." These buy choice lots and ship them to interior places, Rochester, Albany, Boston, Portland, and other cities whose fruits have not yet ripened, where they frequently command double and even treble prices. But these shippers are permitted to use our boxes, and will sometimes, through carelessness or neglect, retain them several weeks. Meantime our berries continue to ripen and must be picked. This unreasonable

detention of the boxes compels us to keep a large reserve supply on hand to accommodate the new pickings. Where the fruit is sold for consumption in New-York or Philadelphia, the boxes are returned by rail or steamboat in two or three days, if the agent should be vigilant and prompt. But even so speedy a return as this obliges us to keep a reserve of empty ones, as when one despatches a chest to either city, he cannot calculate with any certainty on the day for its return. One of my neighbors, whose berry fields are very extensive, has \$1,000 invested in these small boxes.

Then there are agents so neglectful of their employer's interest as to lose large numbers of them, and some who will not scruple to throw the loss on him. When dealing with such agents the loss is sometimes large. Even when our chests come back they are found to contain a most extraordinary jumble of boxes, belonging to a dozen different owners, scarcely any two being alike—one never gets his own. You forward a dozen or a hundred chests with clean, new boxes, and you receive in return a collection of old and dirty ones, gathered up, it would seem, from closets and cellars where they have been mouldering for a year or two. New-York must be nearly filled up with these forgotten wrecks. But the fruit grower has no remedy but to use them, manytimes being compelled to have them washed out and scrubbed, so offensive is their condition, while many broken ones must be repaired.

This condition of the berry trade has always been an intolerable grievance. The boxes cost \$3 to \$4 per hundred, and were too costly to be lost, while the delay in getting them back sometimes drove one to borrow from a neighbor, or buy a new stock, or see his fruit perish unpicked. The vexation was constantly occurring, the large grower suffering more than the small one. But an effectual remedy presented itself, in the production of a box at so low a cost that the grower could afford to let it go with the fruit. No doubt the same idea must have occurred to many. Messrs. Beecher & Son were the first to carry it out, by producing a skeleton basket made of stiff straw board, saturated with varnish to prevent absorption of moisture from the fruit. They were sold as low as seventy cents per hundred. I used them with satisfaction; and though necessarily frail, yet they made repeated trips to New-York and back, many of them, however, returning without bottoms, others racked as if they had been stabbed with a meat axe, and others in the shape of cocked hats, until eventually the whole were used up. But they did treble the duty promised by the makers, who ceased producing them in consequence of the enormous advance in the price of paper.

The necessity for a gift box continued to be a pressing one. When preparing "Ten Acres Enough" for publication, the subject was fully explained and the wants of fruit growers stated, with intimations to inventors that here was a fine opening for some ingenious mind to realize a small fortune by the production of a cheap box. The wide circulation of that little volume brought the suggestion to the notice of numerous parties who saw the subject in a similar light, and who forthwith set about

inventing the desired box. Models of cheap boxes were sent for my inspection, from various parts of the country; some made of paper, others of thin veneer, most of them displaying great ingenuity. Two cheap veneer boxes have since been manufactured, and extensively used. They are really gift boxes, being sold at so low a rate that the berry grower can afford to let them go with the fruit. Many of them are sent from the manufactory in flats, thus packing very closely, and costing but little for freight. As the two pieces which compose the box are shaped and scored for putting together without requiring nails, the process of setting them up into a box is both simple and rapid.

But the invention of gift fruit boxes has been actively prosecuted ever since such wide currency was given to the idea in the volume referred to, and it continues even to the present time. It would seem that no sooner does the inventive talent of our country receive notice that the public is in want of some particular thing, than it springs forward with impetuous eagerness to supply it. New boxes continue to be sent to me, until a large shelf is now filled with them. Two of these, not patented by those who sent them to me, have been patented by others, who must have struck upon the same devices in belief that they were original with them. About twenty have been patented since it became known that such an affair was wanted. Joint stock companies have been formed to manufacture them, large factories built, and many thousands of dollars invested in the business. As gift boxes, cheap enough to give away, some were failures because of excessive cost. Paper has been entirely superseded in consequence of rise in price. Wood only is now used, the thick log is unwound by powerful machinery into a thin veneer, which may be rapidly converted into a perfect box. Whatever imperfections existed at the beginning of this manufacture are being remedied. The great struggle among rival establishments is to reach the ultimatum of cheapness and efficiency, and it is probable the perfected gift box will supersede all others.



Fig. 2.—Sides of Box.

At a recent meeting of the Horticultural Society of Vineland, no less than ten new boxes and baskets were exhibited, most of them intended as gifts, with several specimens of cheap crates, also to be given away. There are two factories in this city, in which immense quantities of boxes are annually produced. One of these manufactures the Burlington free box, made by unwinding a bass log into a thick veneer, and simultaneously punching out the two pieces which form the box, ready to tuck together without nailing. A joint stock company control the patent, and have erected a capacious brick building, which is well supplied with ingenious and costly machinery, driven by an eight horse engine. The accompany-

ing cuts represent the two pieces which form this box, as well as the completed box. [Fig. 2, the piece forming the sides,



Fig. 3.—*Bottom.*

shows the bottom—

scored or partly cut at the dotted lines, so as to be folded up like pasteboard. The tongue buckles into the two slots, closing like a pocket-book.

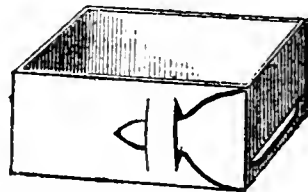


Fig. 4.—*Box Completed.*

buckling into the two slots at each end. Fig. 4 is the box when finished.

In the second establishment a strong box is manufactured, intended to be returned to the fruit grower, and so to last for several years. This is also patented. The sale of these several kinds of boxes has been annually increasing with the extension of our fruit culture, until the business has taken rank among the staples. It is probable that these two factories sell nearly a million and a half per annum. Then in Philadelphia there are other establishments which also dispose of many thousands.

As before mentioned, the fruit-grower delivers his chests or crates at the freight station if for New-York, or on board the steamboat if for Philadelphia, marked with his agent's name. The latter is in waiting to receive them. He advances the freight, a cent and a half per quart from Burlington to New-York, which includes return freight on the empty chests. The charge to Philadelphia is about half a cent per quart. We continue forwarding during the week, and usually every Monday receive account of sales, with a check for the amount. When requested, the agent will remit daily, and will also write or telegraph as to prices obtained, so as to keep us posted up. To large consignees this is sometimes an important matter. The agent's charge for selling the fruit and returning the boxes is ten per cent. Thus the whole business of reaching the market is thoroughly systematized, and is conducted with the least possible trouble to the producer. He delivers his fruit at the freight station, and then all his care over it is at an end. It yields to the railroad company a very large income, and hence they provide every possible facility of low charges, quick transit, and through travel without change of cars. A few years ago this business was but a small item to the railroad; but it has now grown to be an enormous one. It would be difficult to conjecture with accuracy what it will amount to ten years hence; but it is quite certain that it could not be continued, much less enlarged, unless it were known to be profitable.

SIX BEST MARKET APPLES.—A ballot was taken on this subject at the meeting of the Horticultural Society of Western New-York, held at Rochester in January, 1868, with the following result: Baldwin, '43 votes—Rhode Island Greening, 40 votes—Roxbury Russett, 26 votes—King of Tompkins County, 22 votes—Northern Spy, 21 votes—Twenty Ounce, 19 votes—Spitzenburgh and Golden Russett, each 7 votes—Tallman Sweeting and Red Astrachan, each 5 votes—Hubbardston Nonesuch, Gravenstein, Swaar, each 3 votes—Wagener, Seeknofurther, Sweet Bough, Peck's Pleasant, Detroit Red and Early Harvest, each 2 votes.

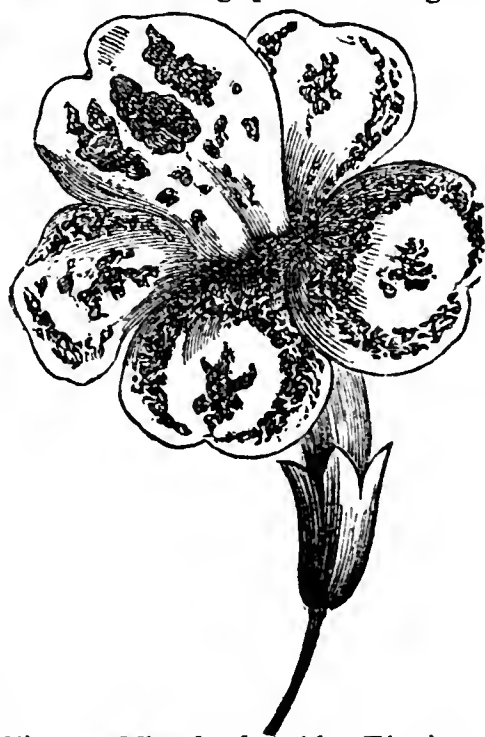
SELECT FLOWERING PLANTS.*

A GERATUM CŒLESTINUM.—The genus *Ageratum*, (fig. 1,) the name of which is derived from two Greek words, signifying never growing old, from the durable nature of its colors—comprises some of the finest compound flowers, remarkable for their soft, rounded, fringe-like appearance. They are hardy annuals for beds or borders, and are exceedingly useful for cutting; they continue in flower during the season, and are among the finest ornaments of autumn. They also succeed well as winter flowers in the house. The flowers are rather small and grow in clusters. They are easily cultivated, and succeed well in any good soil. Care should be taken, as with all other flowering plants, to give

Fig. 1.—*Ageratum*.

them sufficient room, they should be transplanted or thinned out at least six inches apart. The species represented in the accompanying engraving has light blue, fragrant flowers; the plant grows about a foot high, is of compact habit, and an abundant bloomer. Not being common, no English name has been attached to this plant.

MIMULUS HYBRIDUS TIGRINUS.—The plant represented in the accompanying engraving (fig. 2) is remarkable for the beauty of its spottings, resembling the

Fig. 2.—*Mimulus hybridus Tigrinus*.

*For the cuts which illustrate this article, and for a part of the materials, we are indebted to JAMES VICK of the Rochester Seed Store, who has done much towards introducing the rarer sorts.

finest Calceolarias. One variety has the stems and leaves dark brown, with very large, deep yellow, dotted flowers. The plants are not sufficiently showy for the garden, on account of their delicate low growth, but are fine for pots or baskets, or for winter flowering in the conservatory. The seed are quite small, and need care in sowing.

THE ASTERS.—"No class of flowers," says Vick, "has been so much improved within the past twenty years as this splendid genus, and none has advanced so rapidly in popular favor. They are now as double as the Chrysanthemum or the Dahlia, and almost as large and showy as the Pæony, and constitute the principal adornment of our gardens during the autumn months. Give the Aster a deep, rich soil, and mulching with coarse manure is very beneficial. Plants may be grown in the hot-bed, cold-frame, or a seed-bed in the garden. They can be transplanted very easily. Twelve inches apart is the proper distance for making a showy bed of the large varieties; the dwarf kinds may be set six inches or less. The tall, large flowered varieties need a little support, or during the storms of rain and wind they are easily blown down when in blossom. Set a stick in the ground close to the roots, and fasten the stem to it about the centre. The top of the stake should be about 6 inches below the flowers, and it will not be seen. The dwarf varieties are very interesting. Hardy annuals."

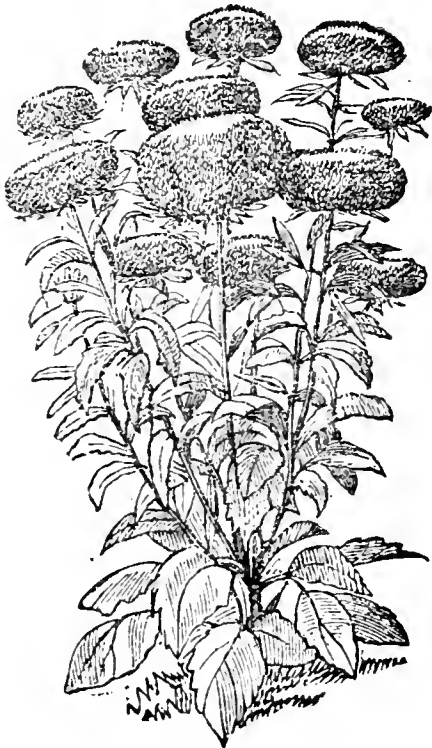


Fig. 3.—*New Victoria*.



Fig. 4.—*Early Fl. Dwarf Chrysanthemum*.

The *New Victoria* (fig. 3) has flowers of the largest size. The plant grows nearly two feet high, each plant bearing from twenty to forty flowers with mixed colors. The engraving represents the plant reduced to about one-fifth of its natural size in diameter—of full size one of the flowers would extend across this page.

The Early-flowering Dwarf Chrysanthemum (fig. 4) grows about half as tall as the preceding, or a little less ; it has large flowers with mixed colors.



Fig. 5.—*Dwarf Chrysanthemum-flowered Crown.*

The Dwarf Chrysanthemum-flowered crown (fig. 5) is one of the most beautiful and finest of its sort, the central petals being pure white.



Fig. 6.—*Newest Dwarf Bouquet.*

The Newest Dwarf Bouquet, (fig. 6,) appears like a small bouquet of flowers set in

the ground, and presents about a dozen different colors mixed. It is fine for edging and for small beds. The plants should be placed about 5 inches apart.

DWARF FRINGED AGROSTEMMA.—(Fig. 7.)—The name of this genus, from the Greek, signifying “the crown of the field,” indicates the showy character of the flowers—somewhat resembling the Pink, but usually grow-



Fig. 7.—*Agrostemma Dwarf-Fringed.*



Fig. 8.—*Dwarf Rocket Larkspur.*

ing on taller plants. They are hardy annuals or biennials, bear transplanting well, and should be six inches apart. The Dwarf-Fringed is new, and is of a fine rose color, with a white centre.

DWARF ROCKET LARKSPUR.—(Fig. 8.)—The Larkspurs are a well-known genus of beautiful flowering plants—all hardy—the prevailing colors blue,

white and pink—flowers borne on long spikes. The seed should be sown in autumn, or very early in spring. Among the annual Larkspurs the dwarf sorts make a beautiful and varied mass of flowers—somewhat resembling a bed of Hyacinths. To become well developed, they should stand about 5 inches apart. The larger sorts of course require much more room.



Fig. 9.—*Digitalis* or Foxglove.

DIGITALIS OR FOXGLOVE.—(Fig. 9.)—The genus *Digitalis*, named from *Digitabulum*, a thimble, in allusion to the form of the flowers, of the common or purple species, is a well-known hardy ornamental plant. It is raised easily from seed, and blooms the second year. There is a peculiar and graceful beauty in the form of the spikes, densely and regularly covered with the large, drooping, tubular, spotted flowers. The color commonly varies from white to purple, but we have received specimens from Mr. Vick of a fine nearly clear red. In addition to the common species there are a large number of others, possessing more or less beauty or singularity, mostly growing native in the different countries of Europe.

TEN WEEKS STOCK.—The Ten Weeks or Annual Stock (figs. 10 and 11) presents nearly or quite all the requisites of a perfect flowering plant—good habit, fine foliage, beautiful flowers of almost every delicate and desirable tint, delightful fragrance, early flowering and abundance of blossoms. Flowers in splendid spikes. The best seeds are from German growers of this splendid flower, from selected pot plants, and more than three-fourths will produce fine double blossoms.



Fig. 10.—*Ten Weeks Stock—Dwarf.*



Fig. 11.—*Ten Weeks Stock—Branching.*

The seed may be sown in the hot-bed or cold frame, or in the open ground in May. The plants are easily transplanted when small. They should be

removed from the seed-bed before they become "drawn" or slender, or the flowers will be poor. Make the soil deep and rich. Set the plants about twelve inches apart. They are half-hardy annuals.

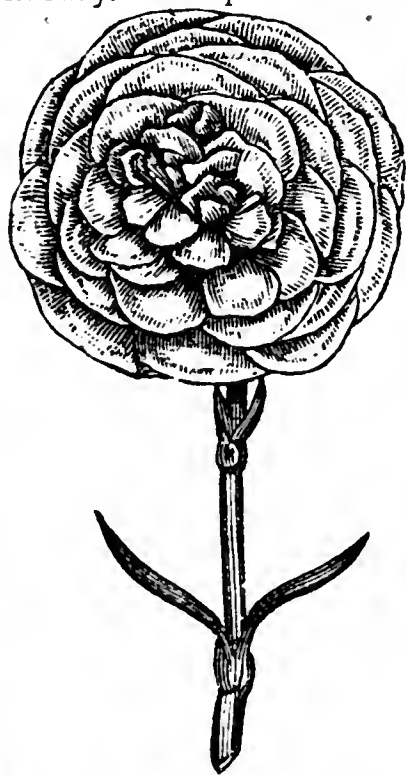


Fig. 12.—*Double Pink.*

THE PINK—*Dianthus hortensis*—(fig. 12.)—Although closely allied to the Picotee and Carnation, the Pink possesses the advantage of being quite hardy. The flowers are not so large, but are remarkable for the beautiful variegation which they exhibit—the spots, dottings, streaks, blotches and rings running into almost endless forms. They are also much admired for their fragrance.

SCABIOSA OR MOURNING BRIDE.—This genus comprises very showy and pretty half-hardy annuals, excellent for beds and for cutting for table bouquets and other ornaments. Some of the species are a little coarse. Of all colors from almost black to white. The tall varieties are about two feet in height, the flowers being supported on

long, wiry stems. The dwarf varieties are about a foot high. The new

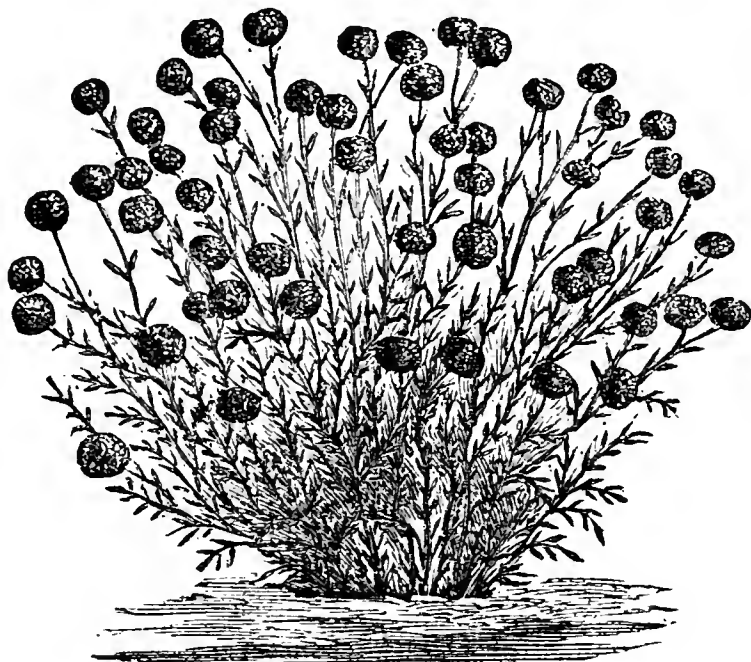


Fig. 13.—*Double Dwarf Scabious*.

Double Dwarf Scabious (fig. 13) has been lately introduced, and quite meets its recommendation. The flowers are of all the beautiful colors of this family. The plant is of a roundish, dwarf compact habit, and a most abundant bloomer until after very hard frosts. The appearance of the plant in blossom is shown in the engraving.

DOUBLE HOLLYHOCK—*Althea rosea*—(fig. 14.) — The old



Fig. 14.—*Double Hollyhock*.

single Hollyhock so common in every garden, has of late years been wonderfully improved, and the dense double flowers of nearly all colors which have been obtained by florists, have rendered it one of the finest and most showy of the larger ornamental plants. They are too tall for small beds, but may be placed on the further side of the grounds, or in the centre of large circular beds on lawns, if surrounded by other plants gradually tapering downwards from the centre. The Hollyhock, it is well known, is a biennial, flowering the second year; but specially fine or desirable varieties may be increased and continued by dividing the roots. Unlike some other double-flowering plants, however, nearly all the best seeds from reliable dealers produce excellent double flowers.

THE PANSY—*Viola tricolor*—(fig. 15.)

—Although the Pansy is a well-known plant, and very easily kept in cultivation in shaded places, the large and improved varieties are more rare. We have measured flowers of these two inches in diameter; and the

richness and brilliancy of some of the new sorts are scarcely equalled by

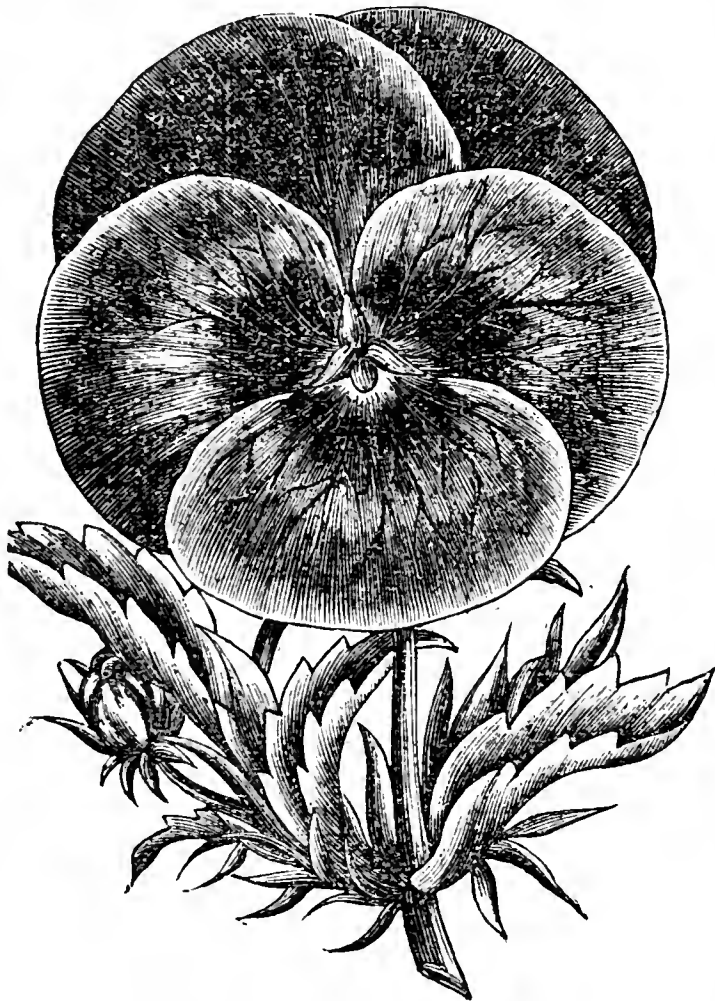


Fig. 15.—Pansy—Natural Size.

by any other flower. The Pansy is one of the first blooming plants in spring, appearing almost as soon as the snow is gone, and it continues long after severe autumn frosts. During the heat of summer it blooms well only in shaded places which are kept moist. If exposed to the sun of mid-summer, the flowers are small, but they increase in size and beauty as the weather becomes cooler.

BALSAM—*Impatiens balsamina*.—One of the most popular and the most beautiful of our half-hardy annuals, but a rich soil and good culture is needed to bring it to perfection. With good care, very few flowers will afford more satisfaction. Sow in a

frame or in a sheltered bed in the garden, in the spring, as soon as the weather



Fig. 16.

Natural Growth.

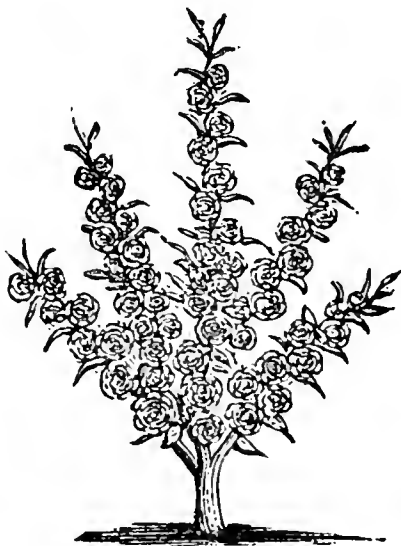


Fig. 17.

Pruned to Five Branches.

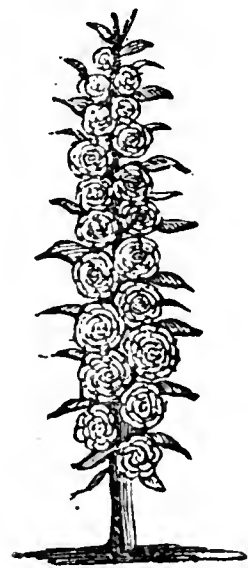


Fig. 18.

Single Stem.

is rather warm. Transplant as soon as the second leaves have made a



Fig. 19.
Dwarf—Pruned.

little growth. Set the plants ten or twelve inches apart, and when the side branches appear, pinch off all but three or four, and pinch out the center shoot. Those left will then grow very strong, and the flowers will not be concealed by the foliage, as is the case when the plant is left unpruned. A very good way is to keep all the side shoots pinched off, leaving only the leading one. This will grow two or three feet in height, and a perfect wreath of flowers. Treated in this way, they will bear close planting. The Dwarf Balsams grow only about six inches in height, while the tall varieties will often reach nearly three feet in a rich soil. The engravings show the effects of these different modes of pruning.

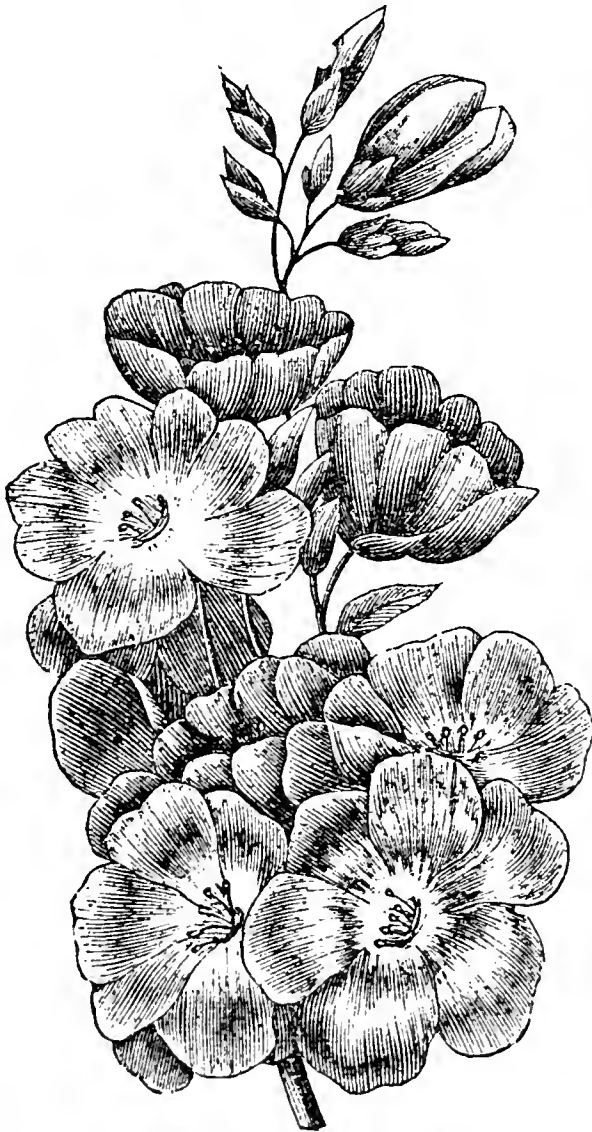


Fig. 20.—*Calandrinia*.

CALANDRINIA.—This is a class of fine, free-flowering annuals, which should be treated as half-hardy,—though some of them are quite hardy. *Calandrinia umbellata*, exhibited in the annexed figure, (fig. 20,) is a perennial, though flowering the first season. Flowers rosy purple.

Since the preceding pages were stereotyped, we have received some additional engravings from Mr. Vick, two of which are here inserted—fig. 21, Flower of the Garden or Florist's Pink, full size—fig. 22, flower of *Digitalis*, full size, (see page 296.)

MANAGEMENT OF FLOWERS.

The excellent practical remarks which follow are from the pen of Mr. VICK, well known as one of the most skillful and successful florists, and whose flower grounds of nearly thirty acres, near the city of Rochester, are not excelled on the continent for their rare and brilliant collection.

PREPARING THE GROUND.—The soil for flowers should be a mellow

loam, if possible, made deep—a foot or eighteen inches at least—and then the plants will not suffer so much in dry weather. It should also be well pulverized—completely broken up—and made as fine and mellow as possible.

It is useless to try to grow good flowers on a poor soil; so, if not naturally rich, make it so with a liberal supply of well rotted manure. Every one—even those who do not keep a horse or a cow—can have a good pile of manure for flowers without cost. Obtain a lot of turf from the sides of the roads and the corners of the fences, place it in a pile, and throw all the soapsuds and slops upon it. In the autumn collect the fallen leaves and put them upon this compost heap. Keep adding to it as you have time and convenience; and when well rotted, you will have an excellent manure for flowers. Always drain the flower garden, so that



Fig. 21.—*Flower of the Garden Pink.*

water will not lie on or near the surface.

SEED-BED.—When the conveniences of a hot-bed are not to be had, make a bed of light, mellow soil, in a sheltered situation in the garden; and as soon as the weather becomes settled, and the ground warm, sow the seeds, covering them with a little fine earth, and if very small, sift it upon them. Some one has given as a rule that seeds should be covered twice the depth of their own diameter; that is, that a seed one-sixteenth of an inch through should be covered one-eighth of an inch. Perhaps this is as near correct as any general rule can be. If the weather should prove very dry after sowing, it would be well to cover the beds of very small seeds with damp moss, or what is better, with evergreen boughs. A covering with boards, or almost anything that will afford partial protection from the drying winds and sun, will answer a good purpose, for it must be remembered that seeds do not require light for their germination, and grow quite as well in the dark until they are above the ground. The covering should be removed as soon as the plants are above the soil, or they will become weak and pale. Of course it is designed that plants from the *hot-bed*, *cold-frame* and *seed-bed*, shall be transplanted to the border or beds

where they are to flower, and these helps are intended mainly for *Tender* and *Half-Hardy Annuals*. The *Hardy Annuals* may be sown where they are to flower, though, with the exception of a few varieties difficult to trans-

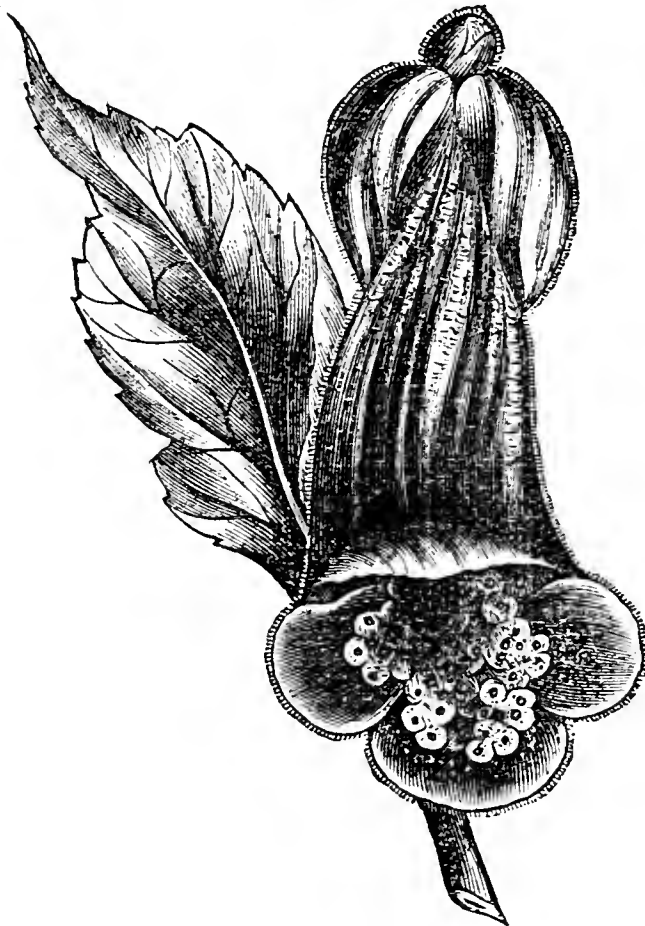


Fig. 22.—*Digitalis*—Full Size.

plant, it is best to grow all in the seed-bed. Some persons succeed very well by starting seeds in the house window in flower pots. A much better plan is to use shallow boxes, because the earth in small pots becomes dry very rapidly, and unless constant attention is given to watering, the plants will be partially or entirely ruined.

CAUSES OF FAILURE.—

In the first place, however, we will examine the causes of failure. If fine seeds are planted *too deep*, they either rot in the damp, cold earth for the want of the warmth necessary to their germination, or, after germination, perish before the tender shoots can reach the sun and air; so that

that which was designed for their support and nourishment proves their grave. If the soil is a *stiff clay*, it is often too cold at the time the seeds are planted to effect their germination; for it must be understood that *warmth* and *moisture* are necessary to the germination of seeds. Neither of these will do alone. Seeds may be kept in a warm, dry room, in dry sand or earth, and they will not grow. They may be placed in damp earth, and kept in a low temperature, and they will most likely rot, though some seeds will remain dormant a long time under these circumstances. But place them in moist earth, in a warm room, and they will commence growth at once. Another difficulty with heavy soil is that it becomes hard on the surface, and this prevents the young plants from “coming up;” or if, during showery weather, they happen to get above the surface, they become locked in, and make but little advancement, unless the cultivator is careful to keep the crust well broken; and in doing this the young plants are often destroyed. If *stiff*, the soil where fine seeds are sown should be

made mellow, particularly on the surface, by the addition of sand and light mould.

If seeds are sown in *rough, lumpy ground*, a portion will be buried under the clods, and will never grow; and many that start, not finding a fit soil for their tender roots, will perish. A few may escape these difficulties and flourish.

TRANSPLANTING.—After the plants in these beds have obtained their second leaves and made an inch or two of growth, they should be removed to the garden beds or border. This should be done on a dull, showery day, if possible; if not, the plants may require shading after removal until they become established. In transplanting in dry weather, always give the plants a good soaking with water, and also the soil to which they are to be removed, an hour or so before removal. Remove them with the transplanting trowel, and disturb the roots as little as possible. If the plants are not too thick, this is not difficult; and in sowing, it is well to have this in view, and sow evenly and thinly. As soon as the young plants come up, if too thick, a portion should be removed. A few plants, with long tap-roots, will not bear removal well. The Larkspurs are difficult; and these and the Poppies, and plants with like roots, should be sown where they are to flower. Still, there are few plants but can be removed when young, with proper care. Sweet Peas, Candytuft, and a few flowers of similar character, that do best if sown as early as the ground can be got ready, should always be sown where they are to flower.

IMPLEMENTS IN RURAL ECONOMY.*

SEED SOWERS.—Those who have been compelled to plant garden seed by the slow process of thumb and finger will find a great relief in using some of the simple hand drills. One of these is represented in fig. 1. It is furnished with a cylinder and brush within the hopper, and these are worked by gearing. It is capable of sowing all the common garden seeds with rapidity and regularity.

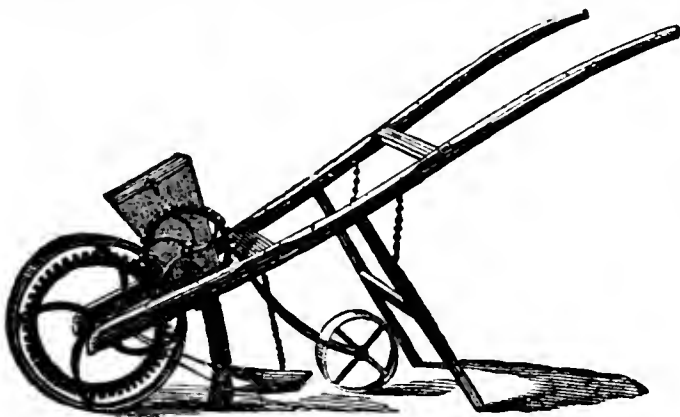


Fig. 1.—Seed Sower.

The Wethersfield Seed Drill, (fig. 2,) is simpler in its construction, and is furnished with a large

* We are indebted to R. H ALLEN & CO., of New-York for most of the cuts which illustrate this article, who are also able to furnish from their agricultural warehouse the implements figured and described.

roller for pressing the surface, as it passes. It is particularly adapted to

sowing onion seed for
old culture.

HAND CULTIVATORS.—Harrington's Hand-Cultivator, for cleaning drilled crops, is represented by fig. 3. It is particularly useful for small field culture, for cleaning such crops as carrots, rutabagas, onions, &c., and is becoming a very popular implement. By the removal of the cutting irons and attaching the seed droppers, it is readily converted into a seed sower, now regarded as one of the best in use.

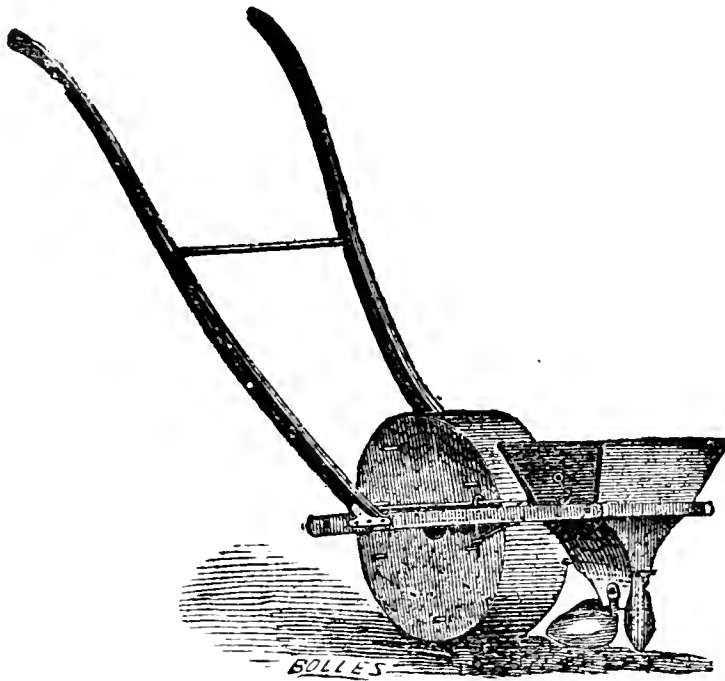


Fig. 2.—*Wethersfield Seed Drill.*

The Weeding Hoe, (fig. 4,) is used for a similar purpose. It is furnished with one or two wheels, and is used in weeding garden or field crops. The wheel or wheels gauge the depth accurately as the knife is thrust forward just beneath the surface, in full view of the plants.

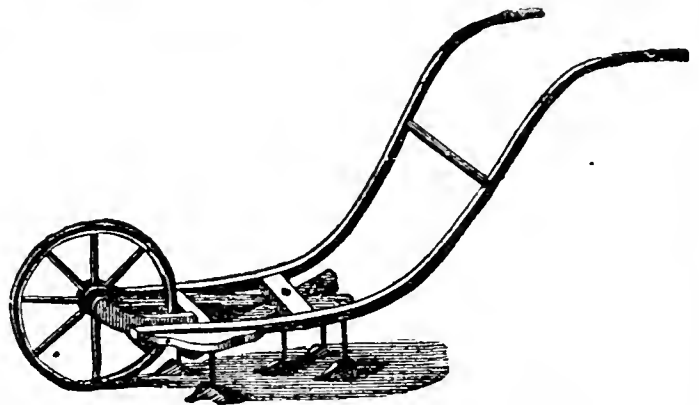


Fig. 3.—*Harrington's Hand Cultivator.*

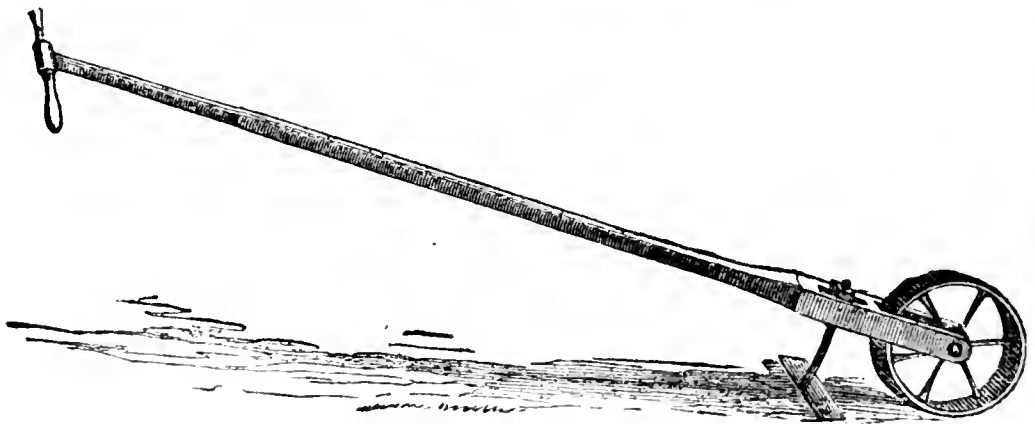


Fig. 4.—*Weeding Hoe.*

GRINDSTONES.—There is no inconvenience which house-keepers more frequently suffer than from dull knives, dull scissors and other cutting

tools. Fig. 5 represents a family grindstone, arranged in a simple and portable shape, always at hand for obviating the difficulty we have mentioned. They are made of various sizes, from six inches upwards, and are furnished with an iron case or trough, as represented in the cut.

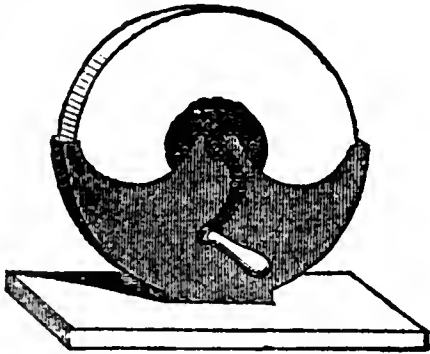


Fig. 5.

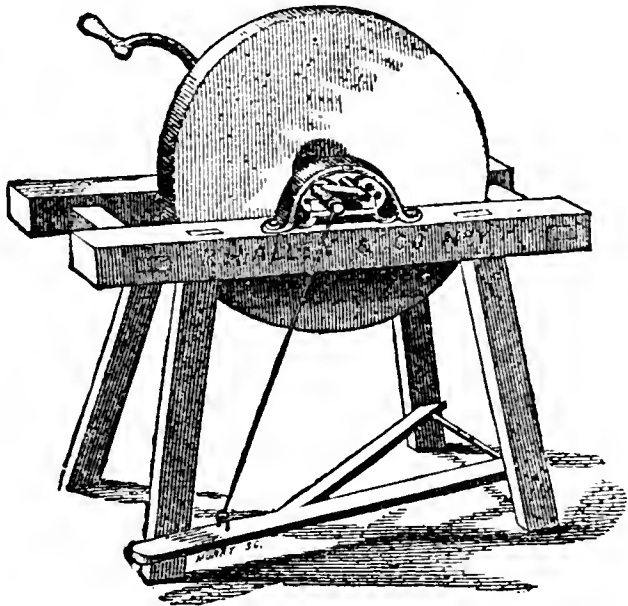


Fig. 6.

On a larger scale, fig. 6 shows a farm grindstone hung on rollers, and furnished with a crank, as well as a treadle for turning it. Every one knows the inconvenience of hunting for a man or boy "to turn grindstone"

when some light tool is to be sharpened; the foot on the treadle obviates the difficulty, and every one can thus wait upon himself. When heavier work is to be done the crank may be used, and the motion of the treadle added if desired.

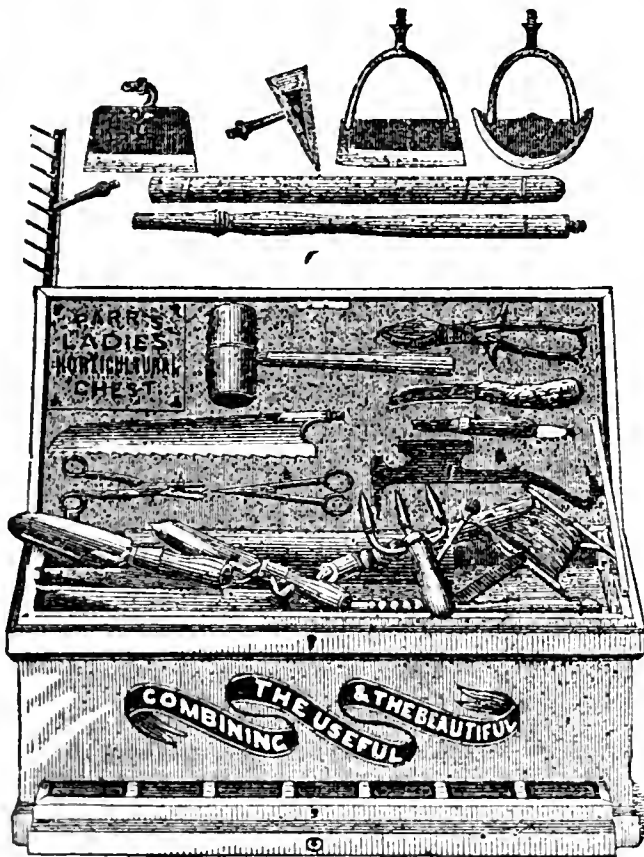


Fig. 7.—*Horticultural Tool Chest.*

A HORTICULTURAL TOOL CHEST.—Fig. 7 represents a chest for holding gardening tools, and intended more especially for the use of ladies. They are made of different sizes,—the larger weighing about fifty pounds, and the smaller, neat and portable, about thirty pounds. Tools requiring long handles are made to fit with screws into screw-jointed handles, which may be taken apart to fit the

chests. The larger size contains drawers with partitions for seeds, garden gloves, &c.

HAND CART.—The hand cart, (fig. 8,) is a great convenience on every farm, and no one should be without one. It is not so low as the truck

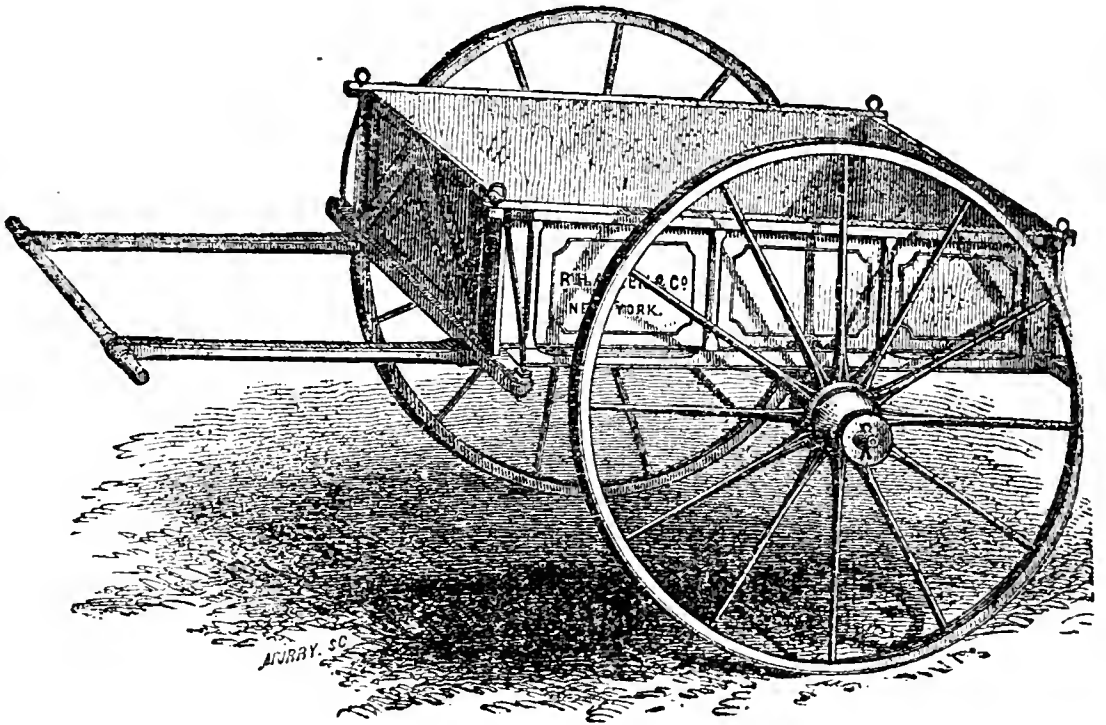


Fig. 8.—*Hand-Cart.*

and wheelbarrow, and is therefore chiefly used for lighter substances, which may be easily lifted into the box. The larger wheels cause it to run much easier, and it may therefore be used about the house, barn, garden, and on the farm generally. It would be difficult to enumerate all the different purposes to which a hand-cart might be thus applied. The one represented in the cut is supposed to have a body about four feet long, two feet ten inches wide, and a foot deep. This is the largest size for the use of one or two men; smaller ones are also useful.

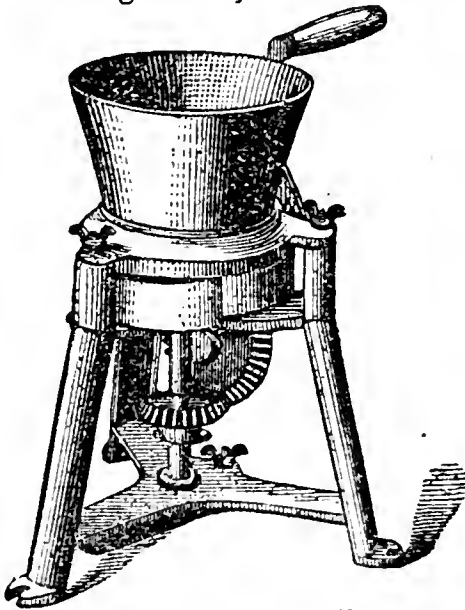


Fig. 9.—*Paint Mill.*

PAINT MILL.—Farmers who have occasion to grind their own paint for outbuildings, or any other substances which need pulverization, whether wet or dry, will find the substantial, portable mill represented by fig. 9, exceedingly convenient and useful. It weighs about twenty-three pounds, and is suitable for ordinary shop use.

WATER BARREL.—Fig. 10 represents a very convenient water barrel, which may hold thirty or forty gallons, mounted on wheels, so as to be

easily drawn when filled with water. It may be used for carrying water for household use, or for watering plants; or it may be employed for

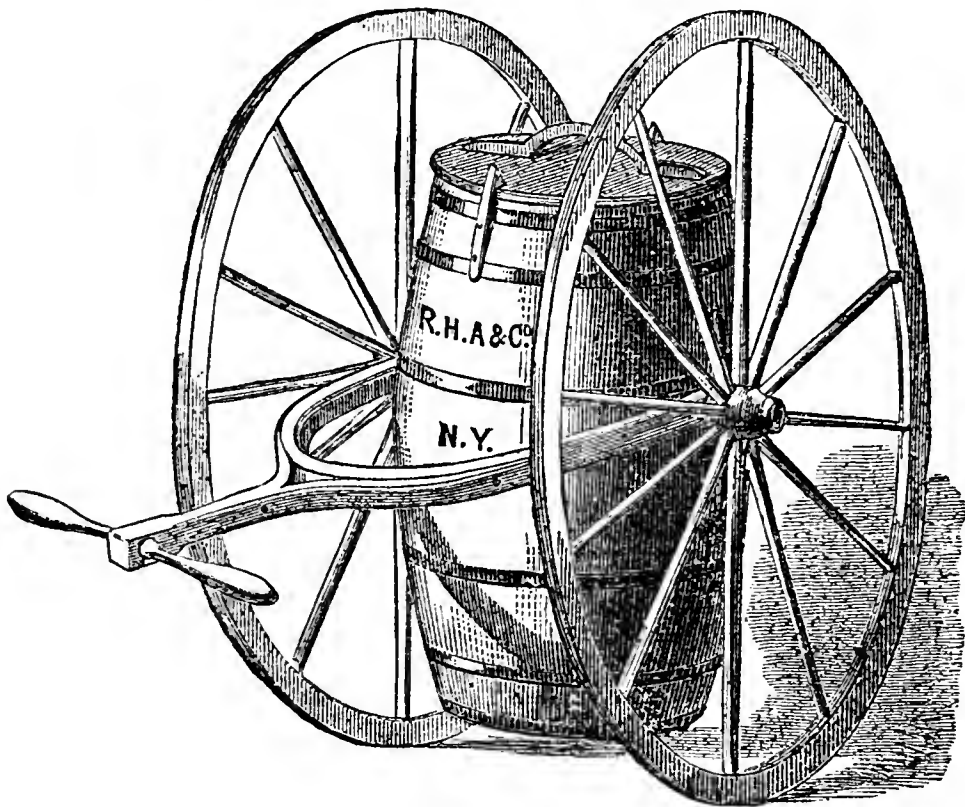


Fig. 10.—*Water Barrel.*

conveying slops or liquid manures to gardens. It may be furnished with a faucet or a hose pipe.

FRUIT LADDER.—There is no convenience which a farmer has less excuse for being without, than a fruit-ladder. Its cheapness—costing but a few dollars at most—and the facility with which it enables any member of the household to reach and select by hand all the lower fruit of a large tree, and the whole of a small one, with rapidity and without bruising, renders it a great desideratum. Fig. 11 represents a simple, broad-based, safe and strong ladder of the kind. The length of the lower rounds tending to making them weak, they are strengthened by the upright bar, which in effect combines three in one. Any ingenious farmer can construct such ladders for himself in winter, or on rainy days.

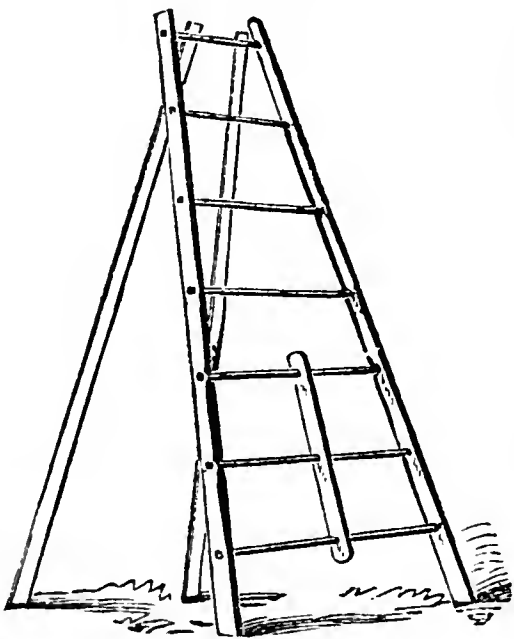


Fig. 11.—*Fruit Ladder.*

DOMESTIC PRESS.—Housekeepers who are familiar with the laborious

work of pressing lard from cotton bags, making currant jelly, &c., will be glad to find a convenient press which accomplishes such work with ease, certainty and expedition, as represented in fig. 12, which nearly explains itself. The screw is turned by the auger handle above, and the expressed liquid passes out through the channel shown at the foot of the cylinder.

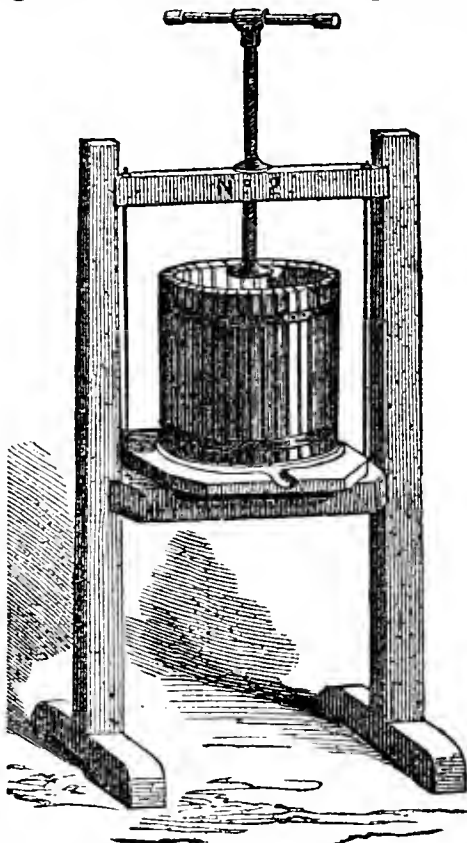


Fig. 12.—*Domestic Press.*

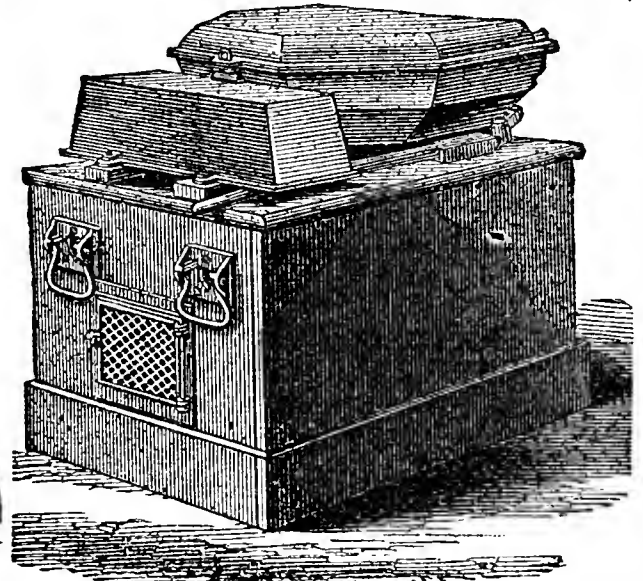


Fig. 13.—*Portable Forge.*

especially if living two or three miles from the "corners" or country village. Fig. 13 represents a new portable forge weighing some 200 or 300 pounds, and furnished with all the usual conveniences of water trough and other fixtures.

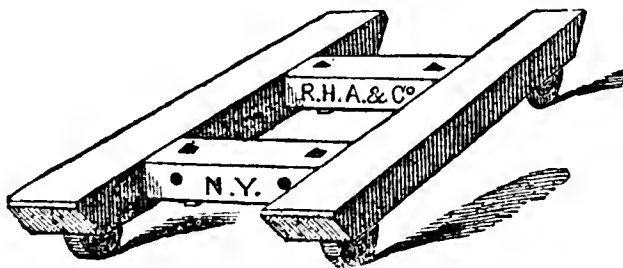


Fig. 14.—*Block Truck.*

BLOCK TRUCK.—Fig. 14 represents a simple, strong frame, running on cast-iron wheels. It is used only on floors or smooth surfaces, and is useful for conveying heavy boxes, barrels, &c., across barn and other floors—the frame

being so low that they are easily loaded and unloaded.

GARDEN SYRINGE.—Fig. 15 shows the form of the best brass syringes for garden use. The

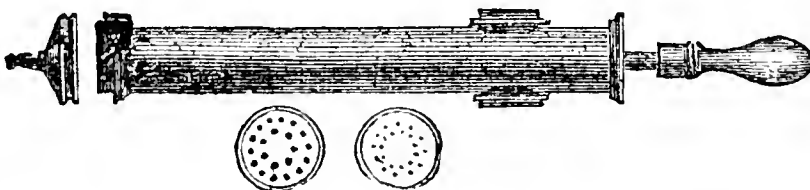


Fig. 15.—*Garden Syringe.*

The jets represented below the syringe have roses with different sized holes, which may

be readily screwed on, according to the intended purpose, whether for a heavy and strong or for a light and soft washing.

IMPROVED BEE CULTURE.

Written for the ANNUAL REGISTER by M. QUINBY, St. Johnsville, N. Y.

WHEN WE ARE ADVISED to follow nature strictly in bee-keeping, we should remember that it is not simply leaving a swarm hived by its own instincts in a tree, but by working in accordance with their natures, and turning their instincts to profit. The farmer, as he gathers his Golden Pippins and contrasts them in size and flavor, with the wild crab, will at once perceive the agency of man in the change. The apple seed, without the cultivating care of man, would make anything but a comely and productive tree. It grows irregularly, produces leaves and wood in abundance, but furnishes but little fruit. By a little intelligent interference man controls this growth, and converts it into fruit. With the apple we have reached very satisfactory results. So with our Indian corn. Without assuming to have attained perfection, we find it so changed from its original appearance that it would be somewhat difficult to trace a resemblance.

But when we consider the state of progress in bee culture, we find that far less advancement has been made, and comparatively little actual knowledge obtained of the means of controlling the industry of the bee, and applying it for our own benefit.

The keeping and management of bees has been considered very precarious. Modern science has shown that with late improvements the business may be made as successful as most agricultural pursuits. Our sagacity or experience should indicate what are helps and what hindrances to success. Bees have been kept with some profit in sections of hollow logs, and in the plain square box, when the only way of obtaining the honey was by killing the bees. When it was found that surplus boxes could be added to the hive, and they would often be stored with honey of the purest quality, it was no longer necessary to "kill the goose that laid the golden egg." We could eat the honey and yet keep the bees. This was one important point gained.

Next, some one made these boxes mostly of glass, thus displaying the superior quality of honey, and greatly enhancing its value. Judging from the price in market, there has been no improvement in style or quality for the last few years, though the ingenuity of patent venders has been exerted in this direction most of the time. These boxes can be applied to nearly all hives.

In consequence of the prevalent ignorance respecting the natural history of the Bee, the interior of the hive has for centuries been a dark subject. The introduction of the principle of movable combs has given us much needed light, and enabled us to examine every comb, cell and bee, without injury. When a hive becomes queenless, or the queen barren, the fact can be ascertained, and another provided before it could suffer much from

the loss. Should diseased or foul brood affect any hive, it may be removed at once, and before there is any danger of spreading the infection among healthy colonies by robbing.

Full, populous stocks are alone profitable. They cannot well be too populous as long as there is room for all the bees to work. Should any hive become weakened from any cause, aside from disease, it should at once be strengthened. A weak hive costs ten times the care that a strong one does, and pays nothing back. Where many hives are kept, some of them will be able to spare a comb or two filled with sealed brood. Introduce one, two, or three such combs to a weak hive. If the weather be chilly, and there are not bees enough to keep the brood sufficiently warm, cover the hive with a blanket for a few days. Never allow a poor weak hive to stand uncared for in the apiary.

A queen bee will, under favorable circumstances, lay from 1,000 to 3,000 eggs daily. It requires animal heat to hatch these eggs. A cluster of bees is constantly needed to generate it and to make the comb. Others are required to feed the larvæ, and a very important party are the foragers, which bring in food for the young. A small swarm will be fully occupied with these duties, and if any winter stores are accumulated, more bees are wanted. During spring most of the combs become empty.

In populous stocks the queen fills them with brood, which emerges, and is about ready for the first yield of clover. Now if no further room is provided than in an ordinary sized hive, they will probably send out a swarm or two. This is a natural consequence.

It has been ascertained that if abundant room be provided by surplus boxes being placed in immediate contact with the main combs of the hive, the bees that might go off in the swarm would usually remain at home and fill the boxes. This use of surplus boxes at the sides, as well as on the top of the hive, with clean guide combs properly adjusted, has a tendency to prevent four-fifths of the swarms as demonstrated by Mr. Hazen's hive, and when no swarm issues it is reported by Mr. H. that the average yield per hive will be 100 lbs. If an increase of stocks is wished for, the product of one will buy several.

As a further security against swarming, a device has been offered which prevents the queen from leaving. A pen or yard is made in front of the hive, 18 or 20 inches square. Nail together strips that will make it about three inches deep, with floor of thin boards, excepting a strip four inches wide next the hive, which should be of wire cloth for sifting out dust and for ventilation. Around the top on the inside fasten a strip of tin three inches wide, in such a way that it will be parallel with the floor, and thus prevent the queen, whose wing should be clipped, from crawling over. She will creep up the side, but being unable to hold fast to the underside of the tin, will fall back, and finally return to the hive with the bees that will not go far without her. The upper side of the tin should be painted some light color. Cut a place for entrance on one side of this pen, to correspond with the entrance of the hive. To prevent their rearing a

young queen that may supersede the mother, and can fly, it will be necessary to open the hive once in eight or nine days, and remove all queen cells, or if it is wished to replace the old with a young queen, let one cell be left. There will be no risk of a swarm in that case, and when she begins to lay clip one wing.

Whoever handles bees on the improved method, must of necessity possess a little more courage than when using the old box. We want to inspect the whole interior of the hive, and not be alarmed at the first approach of an angry bee. If any person, after reading the description of all necessary means of protection and modes of controlling their disposition, cannot work among them without nervous fear of stings, he should allow others with more energy to do the work.

No one can successfully prosecute bee culture unless sufficient time be set apart for their care, the same as a farmer expects to properly cultivate his various crops, if he can reasonably anticipate profitable returns. One man can take the necessary care of several apiaries a few miles apart. Once a week is as often as such yards need be visited by an expert.

For means of protection in the necessary operations among bees ample provision has been made. To protect the face, a net or veil must be made of the thinnest possible material of sufficient durability. A yard and a half, sewed together at the ends, and gathered with an elastic cord, will slip over a crown of a hat, and form complete protection to the head when tied close around the neck. To facilitate clearness of vision a piece of wire cloth, fine in wire, and coarse as possible in mesh, should be inserted directly in front.

As a further help in controlling them, we want smoke. That produced by burning rotten wood answers an excellent purpose. Any hard wood sufficiently decayed is suitable. It should be sawed or split into pieces an inch square, and thoroughly dried. A piece properly prepared, and a foot long, will burn for hours without blazing. The smoke of a roll of cotton rags will do equally well. Also common smoking tobacco spread on cotton cloth, and fastened in the form of a roll, will furnish a smoke that will subdue angry bees quicker than anything I ever tried. Yet they seem to remember it as something very unpleasant, and associate it with some disturbance of the hive, which is resented accordingly. The smoke of wood does not subdue them so readily, but is preferable.

To direct the smoke in any desired direction, a suitable tube must be inserted through the wire cloth in the bee veil, and secured in such a manner that the end may be held in the mouth. It is then ready for use at any time.

When ready to operate, set fire to the rotten wood, put on the veil, and, if desired, protect the hands with rubber or woolen gloves. Whenever possible, all operations should be performed in the middle of the day. It is not always best to blow the smoke immediately on opening the hive unless there is some decided manifestation of anger, but be ready to drive them back if they rush out, by holding the stick near, and blowing the smoke directly

upon them. Very often in removing the honey-board, or side of the hive, it is loosened with a snap or jar, which will irritate the bees. All movements, especially loosening frames from their fastenings of propolis, should be conducted with care.

These facilities for examining and controlling bees I consider to be at the foundation of improved Bee culture. I have not minutely described any one hive, but have simply given the principles on which the best are based. By being able to control the swarming, and thus realizing the desire for a non-swarmers, one man is enabled to manage alone eight or nine large apiaries a few miles apart.

Heretofore when there were more bees than could be kept in one yard, they had to be taken elsewhere at the expense of hiring a man to attend to each yard during the swarming season. With the best help that could be obtained, there was often a loss of many swarms.

Suppose a person should put in one yard fifty hives, or as many as he could look over in one day, and had seven, eight or nine yards. At an average of 50 pounds from a hive, there would be an aggregate surplus of from 18,000 to 20,000 pounds. Mr. Hazen reports 500 pounds from four hives in one season. At the prices for which honey has been selling for the last few years, a man willing to work would be well paid for his labor; and he *must* work. He must thoroughly understand that not only labor but energy, care and skill are absolutely essential to success.

FEEDING AND REARING DOMESTIC ANIMALS.

SYSTEM OF FEEDING SHEEP IN ENGLAND.

The Norfolk (England) correspondent of the COUNTRY GENTLEMAN gives the following account of the system of management by which sheep are there made to bring from 50 to 60 shillings sterling per head when only one year old:

“At the outset, it may be necessary to inform American farmers that our flocks are out in the fields the whole year round, with the exception of temporary shelter for the ewes in lambing time. From the middle of April to the first week in October, they are feeding on natural pasture, or artificial grasses sown for one year’s lay. During the winter months, they are folded on turnips—usually white turnips for the first month; afterwards swedes cut for them, and fed in troughs, together with a regular allowance of dry food: linseed cake, cotton cake, beans, peas, oats, bran and malt dust, mixed with hay cut into chaff, are the substances commonly employed. My plan is to let the lambs run through a hurdle away from their dams as early as possible; supply them with a few cabbages or turnip tops; at the same time let them have low troughs, in which we always keep fresh broad bran, and if possible, a little sweet leafy clover hay, cut

into chaff, and mixed with the bran. They will begin to eat this when very young, and it will then induce them to eat a few beans or peas, ground and mixed with the bran; but I do not find they care much for the corn until they get several weeks old. I have begun to give some of my oldest lambs a few beans, the last day or two, but they do not care to eat them, and I think the bran and chaff is quite as good for them. I like them to have the most corn when they begin to eat a large quantity of *young green food* or *mangel wurzel*, and I generally begin to reduce the corn when on good sound fresh green feed, which they usually are on before they are weaned. After they are weaned, I give them a little more for the first week or two, unless they are on very good feed, such as cinquefoil or a variety of seeds; I like, if possible, to keep some mangel wurzel for them after they are weaned. I very rarely give my ewes any corn, either before or after lambing, (except a few old broken-mouthed crone ewes,) but if very short of turnips, I sometimes give the ewes with twins a few oats, especially if I have not much hay or chaff, and when oats are cheap, which they certainly are not now. I generally take off all the corn from my ewe lambs* a short time after they are weaned, but continue it with the ram lambs, and some or all of the wethers; after the rams and wethers begin rape or turnips in the autumn, I begin to increase their corn and dry food, until they have a pint of corn and cake each per day, which I think is not too much, especially as they are kept on the turnip land all the winter, and some of my land is heavy, bad feeding ground. *I always try to avoid letting any of my sheep or lambs have any sudden change of food;* and I have no doubt a variety of food is best when it can be obtained, and, in summer, with good water to go to as they like. Half-bred sheep, having a larger frame to support than South-Downs, consume more food; and in order to bring them up to from 70 to 90 pounds weight (of mutton) at a year old, they must be allowed linseed cake, or some other purchased food, at an average cost of sixpence a head per week—for 52 weeks, 26 shillings. It will readily be seen that a considerable proportion of this outlay should be charged to the succeeding crops. An old proverb says: 'The sheep has a golden foot.' Certain it is that the arable land of this county, some of which has been in cultivation for centuries, could not be kept up to its present state of increasing fertility, except by the aid of flocks of sheep, fed in the way I have here indicated."

The advice contained in the italicized sentence of this excellent paper on sheep management, should be constantly borne in mind by those in care of a flock; serious loss may be sustained by violent and sudden changes from semi-starvation (say) to a plentiful supply of succulent food.

EXPERIMENT IN FEEDING LEICESTERS AND MERINOS.

A very interesting experiment in Feeding Sheep was conducted during the winter of 1868, by Mr. JURIAN WINNE of Albany County, an account

* These being highly bred South-Downs, and intended for breeding purposes, do not require forcing. I find they are apt to get too fat on grass alone.

of whose usual practice has been published in a previous number of the Annual Register (Rural Affairs, vol. iv, p. 272.) The present trial was made with the view of throwing light upon the comparative merits of the Merino and Leicester breeds for the production of mutton—it being often claimed for the former that if they weigh less than English sheep, they also consume less food and are equally profitable to feed.

Two lots were set apart, consisting respectively of 60 Canada Leicesters and 61 Merinos; they were weighed Feb. 10th; a careful account was kept of all the food they consumed during the continuance of the experiment, forty-six days, to March 28, when they were again weighed and sent to market. These numbers were thought to represent fairly the whole, and were taken as avoiding the trouble and additional risk of error, which would have been incurred by larger numbers. The experiment began after both lots had been got in good progress—the previous and subsequent treatment of both having been precisely alike. The Merinos were an extra good lot, the one hundred and eighty having been selected out of six hundred—and no complaint could exist against them, as we know by personal examination, on the ground of being below the best merits of their kind. The following are the figures as regards weight, &c.:

Feb. 10—Sixty Coarse Wools weighed,.....	8,870 lbs.
March 28—do. do.	9,878 lbs.
Gain in 46 days,	1,008 lbs.
Total cost of feed, (hay, grain, oil-meal, roots, &c.,) for the 46 days,	\$174.43
Feb. 10—Sixty-one Fine Wools weighed,.....	6,909 lbs.
March 28—do. do.	7,389 lbs.
Gain in 46 days,	480 lbs.
Total cost of feed as above	\$144.78

When both lots were sold, March 31st, the former realized 10 $\frac{3}{4}$ cents per lb., and the latter 10 $\frac{1}{2}$ cents.

A calculation in simple proportion will show that if the coarse wools gained 1,008 pounds at a cost of \$174.43 for feed, the gain of the fine wools at the same ratio upon an expense of \$144.78, should have been 836 pounds, whereas it was only 480 pounds, or a little more than one-half a proportionate amount as compared with cost. As compared with live weight, Feb. 10th, the coarse wools gained 11 $\frac{1}{2}$ per cent. in the forty-six days—the fine wools not quite 7 per cent.

STALL FEEDING CATTLE IN EASTERN PENNSYLVANIA.

In few parts of the country is there better farming, or more attention given to feeding cattle, than in Chester County, Penn. A correspondent of long experience gives us the following excellent suggestions derived from his own practice and that of his neighbors:

Experience has shown that cattle housed all the time will accumulate more fat, and be better contented, than if allowed to go out and become chilled every day for water; in fact, I consider it a loss of several days' feed for a steer to get loose. As to fatten an animal with economy, comfort and contentment is of as much importance as care and food, the charge

of the stock is confined to one trusty man, who must be up early and late, feeding at precisely regular hours, and no strange persons are allowed among them. They soon become accustomed to the voice of the feeder—even know his step, and in a few days become perfectly docile and contented, and commence to put fat on rapidly. Some skill and experience is required in first chaining the cattle up, to regulate them according to their dispositions. This is what we call bossing them. Twenty cattle are turned into the barnyard, enough to fill one stable. Some meal or salt is placed in the centre of the yard, and the steer that drives the rest away and eats, is the first boss. He is turned into the stable and chained at one end. The next boss—that is, the next master steer—is placed beside him, and so on through the whole twenty. They are bedded and the stables cleaned out every day, making large quantities of excellent manure, which is drawn out of the stables on a sled, with a quiet old horse, and placed under a large shed, where it is kept trampled solid by a few sheep or calves. One load of this manure, containing, as it does, all the solid and liquid excrements of the cattle, is of more value than four of such as I described to you above, under the old system. My experience has shown me that cut corn fodder is the cheapest and best food for cattle that are fattened on meal, as its slight constipating character counteracts the effect of too strong feeding on grain. I have fattened prime beef without giving them a mouthful of hay all winter, which, at the present price, is a great economy. I use a telegraph cutter, No. 3, having four knives, cutting about one-eighth of an inch long. It will cut about 500 bundles of fodder per day, with two horses and two men. This will last 80 cattle about one week, feeding some hay with it. The temperature of the stable should be kept as uniform as possible, and if a little care is taken, it need never fall below the freezing point in the coldest weather, as the animal heat generated by so many cattle, creates a warmth all through the building. I have never had a sick steer for the past five years that I have been feeding in this manner, and their good appetites and glossy coats attested to their general welfare. An experienced cattle feeder, and one to whom I am mostly indebted for this system of feeding, informs me that he has not lost a steer in eighteen years that he has been stall-feeding cattle this way.

Cattle feeding is not very profitable business under any circumstances, if you leave the manure pile out of the balance sheet, but some such method is an absolute necessity with us, who inherit the over-cropped soils of the Eastern States, and if we can obtain market price for our grain, we should be contented knowing that every bushel we feed, if properly applied, will raise two bushels another season, and keep the land increasing in value and productiveness. Another point to be looked at is this: There is no profit in keeping any kind of stock that is not improving on your hands. A good steer, that cost you eight cents gross in the fall, say he weighed 1200 pounds, if wintered in a rough, careless manner, will lose 100 pounds by the first of May. Here is a direct loss of \$8 of the purchase money,

and a consequent depreciation of 50 cents per hundred in his value, making a loss of \$14 on him, in addition to his feed. Now take the same steer, house him carefully, and feed him \$25 worth of meal; he will eat 50 per cent. less hay and fodder, and will weigh 1450 by the first of May, and will be worth at least 10 cents per pound. Here you have a valuable lot of manure, your corn paid for, and \$24 besides.

DESCRIPTION OF BARN FOR STALL FEEDING CATTLE.

The same correspondent furnishes the following plan of the barn in which his cattle are fed:

Our barns are double decked, built on the slope of a hill—the stables, consequently, partly below ground. They should always be provided with plenty of windows for light and ventilation in warm weather. The stalls are placed lengthwise, as in the accompanying diagram, which is a sketch of the ground plan:

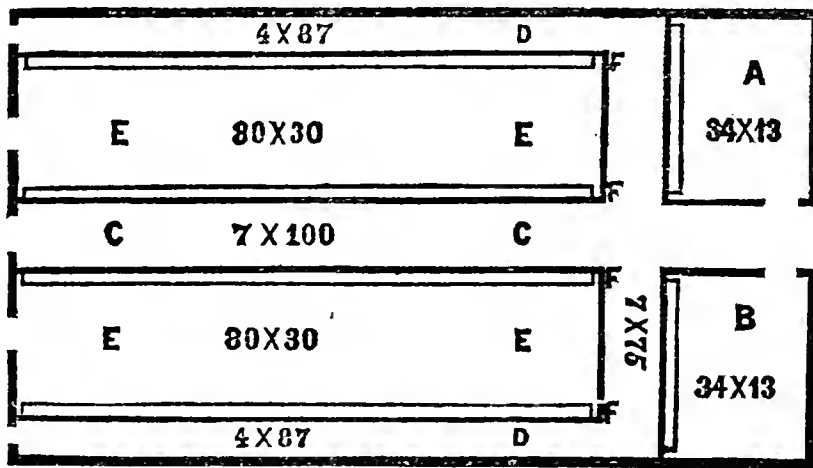


Fig. 1.—Plan of Barn.

The building is seventy-five by one hundred feet square. A is the horse stable, with stalls for six horses. B is the cow stable, accommodating six or eight cows. C C is the main entry, running lengthwise through the barn, seven feet wide, floored with brick placed on their ends. D D are two smaller entries, running on either side of the cattle stables. These stables are 30 feet wide, including rack and trough. The cattle are chained, four feet apart, to a long trough, sixteen inches wide and eight inches deep, running lengthwise of the stable on both sides. Each trough has twenty cattle, chained four feet apart, without head stalls, making eighty cattle, six horses and six cows under one roof. The stock is housed about the first week in December, and are never loosened until they are sold or turned out to pasture, about the 1st of May. They are watered in the trough from the points F F, where stop-cocks are connected with the supply cistern. They are fed three times a day, on cut cornstalks, corn meal and bran, or corn and oats ground together—beginning with a moderate feed, say three quarts, and increasing the supply as their digestive organs become accustomed to the change of food.

EXPERIMENT IN COOKING FEED FOR HOGS.

A Wayne County farmer has accurately tested the results of cooking feed for swine, and presents the following figures :

The experiment referred to was conducted with two pens of hogs, which were carefully weighed, the gains noted, and the food in each case also weighed or measured. The hogs selected for the experiment were all grade Chesters, and, with one exception, nearly of the same age, weight, condition, &c. Pen No. 1 contained three hogs, whose live weight was nearly 1,000 pounds. They were fed all the corn they would eat up clean—the three consuming forty-five pounds of corn daily. After being fed seven days, they were again weighed, when it was found that they had gained ten pounds each. By calculation we find that during the seven days this pen of hogs consumed five bushels and eight quarts of corn, costing \$6.66. The gain being thirty pounds, we see that thirty pounds of pork cost \$6.66, and would have sold at the time for \$2.55. Pen No. 2 contained two hogs, one of which weighed alive six hundred pounds, and the other nearly four hundred pounds. They were fed all the cooked meal they would eat—the two consuming twenty-five pounds of meal per day. The respective gains of each were five and seven pounds, the smaller hog gaining five pounds per day, and the larger seven pounds.

By calculation we find that the pork made from whole corn cost a trifle over 22 cents per pound, while that made from cooked meal cost $4\frac{1}{2}$ cents per pound.

I am aware that seven pounds may seem to some to be an extravagant gain for a hog in one day, but it must be remembered that this was a very large hog, and the experiment conducted in very favorable weather. I succeeded in increasing the gross weight of this hog five pounds each day for weeks together in rather unfavorable weather. I believe we can make hogs profitable, if we feed a few all they can eat, but when we undertake to keep fifteen hogs upon the feed of five, we must expect disappointment and loss. It is also equally essential to have a *good breed* of hogs to feed.

SWEEPING CARPETS.

SWEEPING CARPETS too often wears them out rapidly. It is obvious to any one that a brisk, daily brushing over the whole surface must wear away and carry off more woolly particles than the occasional stepping of feet during the day without the rubbing and scraping given by the broom. To allow sand and grit to accumulate on the surface, and to become ground into the fibres by the pressure of sole-leather is, however, worse than sweeping. They should therefore be always kept clean. Men who object to large carpet bills should provide themselves with slippers, and not come in with muddy boots. It is a matter of economy with them

to pay \$2 or \$3 in the purchase of slippers, rather than a hundred or two for ingrain and brussels. This perhaps would be a stronger consideration with some, and exert a more controlling influence, than frequent sharp reproofs from the mistress of the interior.

There are different ways of sweeping carpets. The most objectionable is performed as follows: The operator first places the broom perpendicularly upon the floor; then with a quick, thrusting motion the lower part is pushed forward and thrown upwards, carrying the dust with it in large clouds, until the air of the room is filled with it. The brush of the broom, by a frequent use, thus becomes bent, somewhat in the form of a hook, as

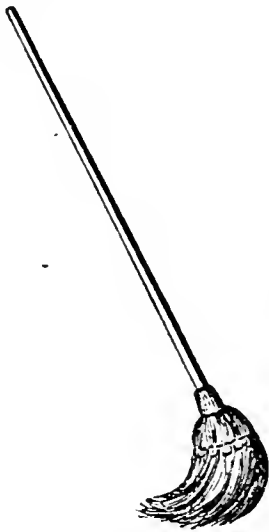


Fig. 1.

shown in the accompanying figure, (fig. 1,) at the same time that it is gradually broken off and worn out. The dust which fills the air gradually settles upon chairs, tables, bureaus, writing desks, cases of books, picture-frames, clocks, maps, looking-glasses, &c. The process thus consists virtually in merely elevating a stratum of dust on the carpet and placing it on all these different articles of furniture. After some minutes the duster passes around and the stratum is removed to its original position on the floor, thus

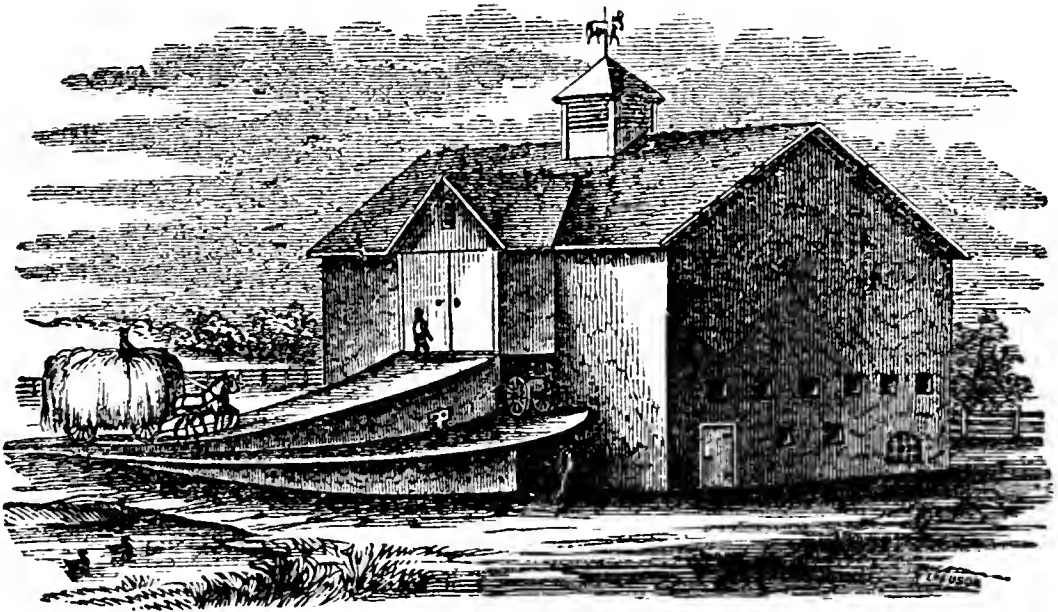


Fig. 2.

making a sort of perpetual motion resembling the great circulation of moisture from the earth to clouds, and from clouds to rain back to earth again.

A much better way for performing the work is to place the broom upon the carpet in an inclined position, with the handle inclining forwards; drawing it quickly over the surface in this position, and scarcely raising it from the floor, will prevent the rising of but very little dust. In order to do the work effectually, however, the motion should not be given by long strokes, but by a quick succession of short ones. It would be worth fifty dollars to any housekeeper who does not understand the business, to see these two modes distinctly performed. By the former or thrusting mode, the coarser dirt, or that which does not rise in the air, is shot ahead several feet, and spread over a large surface. By the latter or drawing mode, it is kept more compactly together, something like the winnow of hay in the meadow. The broom, instead of being bent around like a hook, as above stated, is kept straight and smooth, and lasts several times longer. (Fig. 2.)

In libraries, cabinets, &c., where dust might badly injure or wholly spoil the specimens and books, it is better to procure a patent carpet-sweeper, merely using a broom or brush to clean out the corners and sides.



A THREE-STORY BARN.

H. W. CHIPMAN furnishes to the COUNTRY GENTLEMAN the following plans and description of what he terms a "Model Barn,"

belonging to Alfred Tredwell, Esq., of Madison, Morris Co., N. J., who carefully examined previously many of the best barns of Pennsylvania and other States.

General Dimensions.—The barn is 64 feet square. The first story is 8 feet high in the clear; second, 10 feet; third, 16 feet, and roof 16 feet. The walls of the first story are 20 inches in thickness, the second story 14 inches, and the third 12 inches.

Situation.—The barn is located at the foot of a slight declivity—so slight indeed (8 feet) that the second story floor is upon a level with the high ground in front of the building. The third story is approached by an easy grade of one foot in ten; so that heavily laden teams can readi-

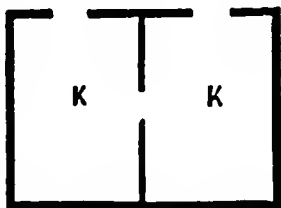
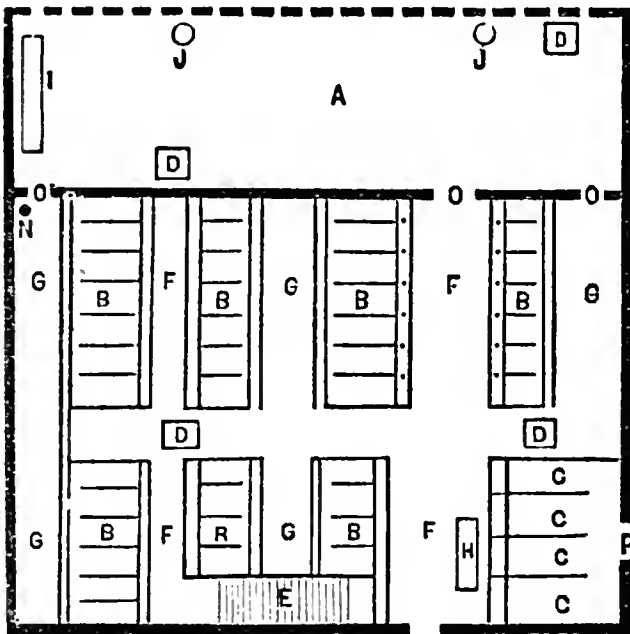


Fig. 2.—First Floor or Basement.

ly enter either floor of the building. The first story of this barn, although nomi-

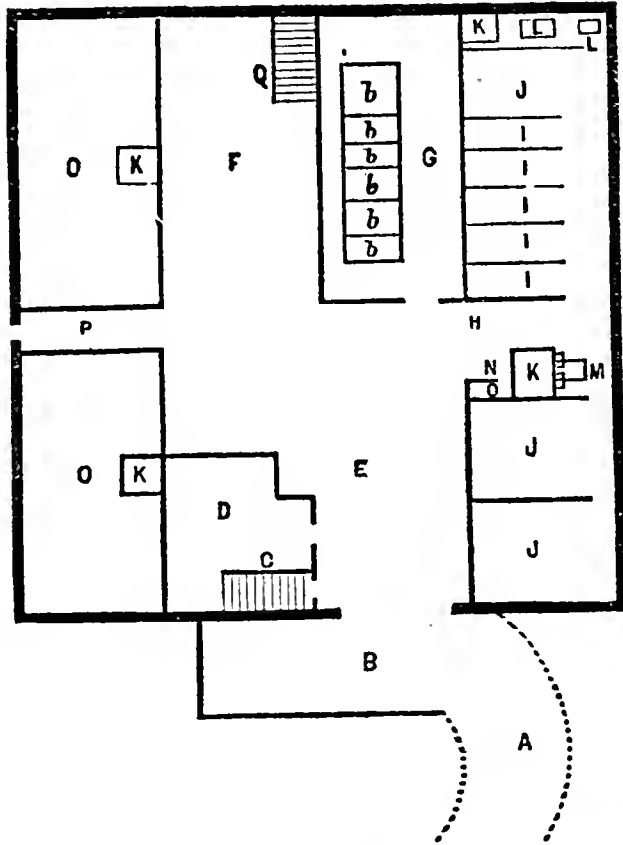


Fig. 3.—Second Story.

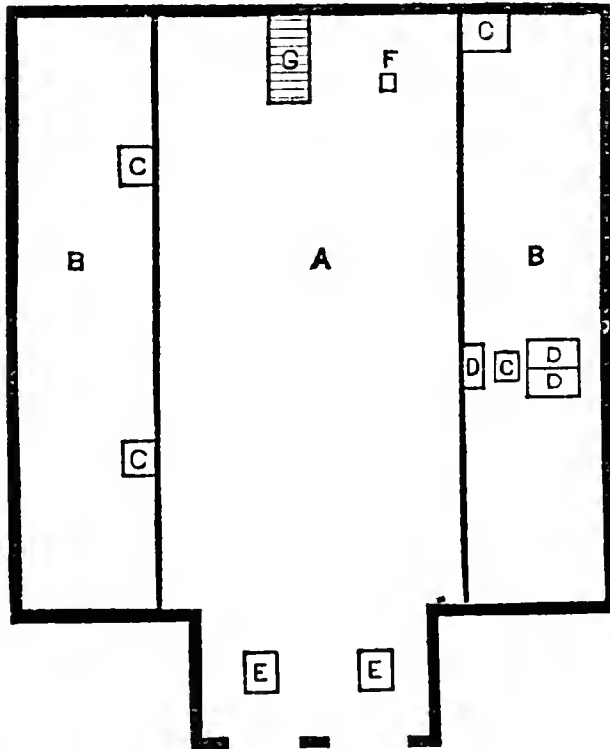


Fig. 4.—Third Story.

nally a basement, is nevertheless free from the disadvantages generally connected with cellars, as it is wholly above ground, and separated from the surrounding bank. The floor of this story is of concrete—readily cleansed, and never decaying.

The chief feature of the second story is its horse stable. The dimensions of the regular stalls, as indicated in the plan, are unusual; but long experience, and at times a very expensive one, has taught Mr. T. that a stall four feet wide will invariably prevent a horse from casting himself, although giving him ample room to lie comfortably, and that one 11 feet deep renders it very difficult, if not impossible, for horses, properly tied, to kick each other.

As a farther precaution, when the horses are all in for the night, a strong rope is passed through rings at the back of each stall, four feet from the floor, thus effectually *boxing* each horse, and, in case any become untied, preventing their leaving their own stalls and molesting their neighbors.

In the third story, the great floor, 32 by 64 feet, with immense bays on either side, is a prominent and exceedingly valuable feature of the whole establishment, and furnishes ample room for many farm

operations, which, for lack of suitable shelter, are oftentimes necessarily performed during extreme weather out of doors. Here were noticed a railway horse power, a threshing machine, a circular saw, a grist mill, fanning mill, Daniel's hay cutter, a cornstalk cutter and masticator, and scales. By nailing strips to the posts supporting the roof, more or less of this floor, as the requirements of the season demand, can be converted into mows for storing hay or grain.

EXPLANATIONS OF PLANS.

Fig. 2.—*First Floor or Basement.*

- A.—Shed 17 by 64 feet; being a portion of the main building, its roof formed by the story above.
- B. B. B.—Cattle stalls, varying in depth from 4 feet 8 inches to 6 feet 6 inches. Two-thirds of these stalls are provided with ordinary cattle chains; the remainder have upright shifting stanchions.
- C. C. C.—Stalls for farm horses, with entrance at P., thus separating them entirely from the horned stock.
- D. D. D.—Hay and straw shoots.
- E.—Stairway connecting first and second stories.
- F. F. F.—Passage-way in front of stalls.
- G. G. G.—Passage-way in rear of stalls.
- H.—Feed-bin for horses.
- I.—Water-trough.
- J. J.—Pillars supporting rear of building.
- K. K.—Root cellars, each eleven and a half by twenty feet, with ten feet ceiling; total capacity 3,312 bushels.
- L.—Covered passage-way between main building and root cellars.
- M.—Cistern for liquid manure, receiving drippings from shed A and yard beyond.
- N.—Penstock delivering water from neighboring spring.
- O. O. O.—Doors for horned cattle.

Fig. 3.—*Second Story.*

- A.—Approach to this story, being on a level with grounds in front of the barn.
- B.—Covered entrance.
- C.—Stairs leading to basement.
- D.—Harness room.
- E.—Floor for harnessing and unharnessing horses.
- F.—Light wagons and carriages.
- G.—Granary, 16 by 34 feet, with bins, *b b b*, of various sizes, and filled by means of a shoot from above where the grain is threshed.
- H.—Sliding door leading to horse stable.
- I. I. I.—Stalls 4 feet wide by 11 feet deep.
- J. J. J.—Box stalls for stallions and sick horses.
- K. K. K.—Hay and straw shoots.
- L. L.—Trap-doors for straw and Manure.
- M.—Box for mixing feed, into which empty grain-spouts from floor above.
- N.—Pump.
- O. O.—Bays for hay—filled from third story.
- P.—Passage-way to side door.
- Q.—Stairs to third story.

Fig. 4.—*Third Story.*

- A.—Floor, 32 by 64 feet.
- B. B.—Bays.
- C. C. C.—Hay and straw shoots.
- D. D. D.—Grain and feed bins.
- E. E.—Shoots for sliding roots into cellars K. K.
- F.—Grain shoot.
- G.—Stairway.

This barn was built of concrete or a mixture of broken stone, cement, sharp sand and water. The expense is not accurately known, but it is stated to be cheaper than either brick or common stone. It is used for a large breeding business, but with some modification will suit other purposes.

DOCTORING SICK ANIMALS.

A FINE HORSE, belonging to the writer, once caught a bad cold, and was afflicted with an obstinate and severe cough—so severe that he could sometimes be heard half a mile. The neighbors were liberal with prescriptions; and ashes, blue vitriol, copperas, castor oil, turpentine, glauber's salts, &c., were recommended in large quantities. The owner concluded that all these, if taken, would be quite enough to kill the animal, and it was therefore decided to give him nothing, and take good care of him. In other words, Dr. Physic was dismissed and Dr. Nurse called in. It was early in autumn; and a good clover lot furnished all the food, which, being of this succulent character, served somewhat as an expectorant. Special directions were given never to work the horse enough to cause sweating, and to blanket him carefully after working, or whenever the weather was cold. In short, everything was done to prevent any further catching cold, and to keep him at all times comfortable—giving very moderate labor. In six weeks he was perfectly well. Dr. Nurse proved his skill and efficiency in this case. If the animal had been dosed, worked hard, and treated carelessly, it is not probable that he would have recovered.

In another instance, a horse by hard usage had a bad attack of sweeney. A "horse-doctor" (so called) offered to cure him for \$20, by some cutting and slashing process. The offer was declined. He finally reduced his proposed charge to only \$3. Had he offered \$50 for the privilege of experimenting on the animal, the offer would have been as promptly refused. A new Dutch collar was procured, and only moderate labor permitted. In a year the sweeney had nearly or entirely disappeared.

When animals are violently and suddenly attacked, it may be best to administer powerful medicines; but they will rarely if ever be thus attacked unless through hard usage. In chronic cases take good care and attend to general comfort, and nature will in time effect a cure. Be very careful to avoid those pretenders known commonly as *horse doctors*.

There is one simple remedy which may be at all times used with safety. This is fresh pulverized charcoal. It can never do any harm, and nothing restores sooner any derangement of the digestive system. Take red burning coals from any wood fire, pulverize them at once in a mortar, and the powder will be ready for use. Mix a teacupful of this powder with a junk bottle of cold water, and pour it down. Horses, cattle, and other animals, which may have been injured by over-eating, or by swallowing bad food, may be readily cured by this remedy.

There is another very safe remedy for all diseases which affect the skin, or begin on the outside, such as scratches in horses, and foul foot in cattle. This remedy is *cleanliness*. Use cold water, or tepid water, according to circumstances, adding soap if necessary. It will have an excellent effect.

Preventives are better than cures; therefore keep all animals in dry clean pastures, or in dry, well littered, well ventilated stables. Never over-work or over-feed. Attend to general comfort in all particulars—protect from cold—feed regularly, and never make sudden changes of food, and you will very rarely have a sick animal.

GRAPE HOUSES.

THE FOLLOWING PLANS AND DESCRIPTIONS of houses for propagating the grape, are taken from the last edition of Thomas' Fruit Culturist, published by Wm. Wood & Co., New-York. These houses were erected at very moderate expense by E. W. Herendeen, and with some modification they may be used for orchard houses or for raising fruit in pots, and for cold or fire-heat graperies, where cheapness and simplicity of construction are desirable.

A plan of the smaller size is represented by fig. 1, and the house is constructed as follows:

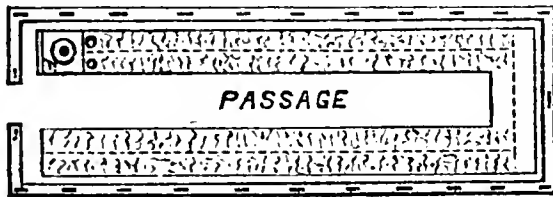


Fig. 1.

Set two rows of cedar posts into the ground about two and a half feet deep, and beat the earth about them well—the rows of posts being eleven feet apart, and the posts six feet apart in the row

—saw the tops off on a level three and a half feet above the ground; board them on both sides and fill in the space with tan or sawdust. Nail to the top of these posts thus sawn off, a scantling two by five feet for a plate to the house. On the inside of the house set two other rows of posts at the same depth as the others, and opposite each one, and at a distance of three feet and four inches from them. These posts are the support of the inside of the tank. Fasten a scantling two by five feet in lengthwise along these posts, and parallel with the plates, by sawing out the posts and letting them into the side an inch or so. The scantling should be about twelve inches from the ground. Run a short scantling from the under side of the long scantlings to the posts supporting the plate, letting them into the posts about one inch, and nailing all securely by using twenty-penny nails. Then put a scantling lengthwise with the house and parallel with the one on the inside of the tanks on the top of the short pieces last mentioned, and near the posts supporting the plate of the house to support the outside of the tank; of course at the same height from the ground. All this frame-work should be very securely made, to prevent the tanks, when filled with water and covered with heavy sand, from settling, as they are sure to do if not well done. The tanks are easily made by using pine plank, an inch and a half thick, planed and matched at the planing-mill, cutting a groove at each end and driving them in point upon side pieces five inches high. They may be three and a half feet wide, and should ex-

tend on two sides and one end of the house, and be divided lengthwise by a board on edge, which supports the middle of the covering placed over them for holding the sand used for propagating purposes. The water should be three inches deep in the tanks, which for this purpose should be very carefully levelled. These tanks are covered with thin boards, which, when damp, are a good conductor of heat from the hot water below. The sand should be clean building or lake sand—not too fine or too coarse—and about three inches deep for starting grape cuttings.

The larger house (fig. 2) is twenty-two feet wide and seventy-five feet long, and is double, being divided into two parts for heating the propagating beds,

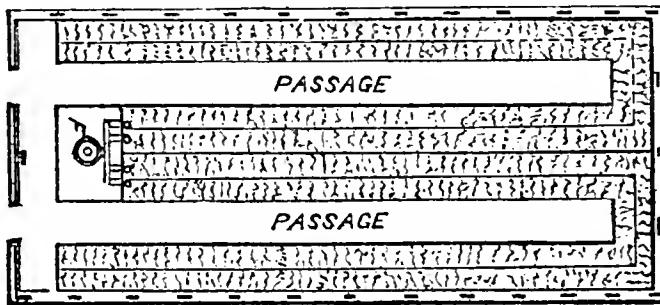


Fig. 2.

but open in one in other respects. The same furnace heats both these parts by branching pipes. A cross section of the double house is shown in fig. 3.

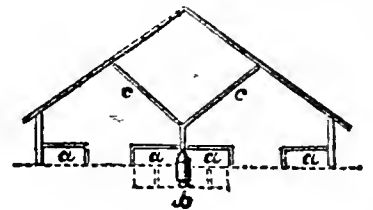


Fig. 3.

The houses thus constructed are heated by a simple and efficient furnace, made at the locomotive works at Geneva, N. Y. The furnace for the larger house is shown in the annexed figures, where fig. 4 is a view, and fig. 5 a section.

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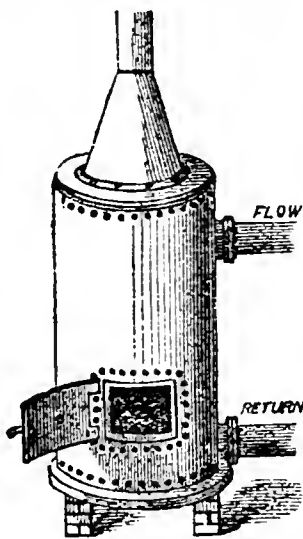


Fig. 4.

the larger house is shown in the annexed figures, where fig. 4 is a view, and fig. 5 a section. It is made of boiler iron, riveted to circular cast-iron plates at top and bottom, with a space within for fire surrounded by water, with the exception of the grate at bottom. The stratum of water surrounding the fire is about an inch thick.

Forty-three pipes, from the fire through the upper plate, carry the hot air and smoke to the expanded smoke pipe, and heat the water with great rapidity. The amount

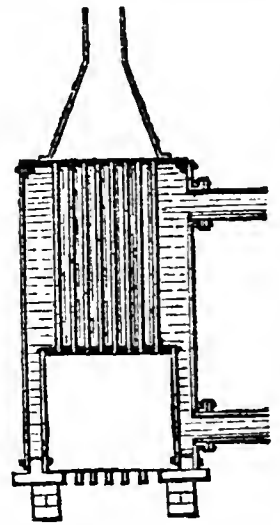


Fig. 5.

of fuel required has been found to be only two-thirds the amount for other heaters in common use.

The size of the boiler for the larger house is about twenty inches in diameter, and three and a half feet high, and smaller for the other house. The hot water pipes connecting with the tanks should be three inches in diameter inside for the small house, and four inches for the larger. Six tons of coal only were used throughout the entire season of spring propagation, for both houses.

TO INCREASE THE PRICE OF FARMS.

VARIOUS MOTIVES actuate different land owners in making improvements. But no appeal can be made to them that will be so generally felt as to urge the importance of increasing the money value of their estates. When we say to them that we have a secret to impart by which they may add five, or ten, or twenty dollars per acre to the price which their farms will bring in market, they listen, as they should do, with interest. It is for the purpose of augmenting their property that their labors and exertions are applied year after year. To some of our readers we shall not impart what is entirely new, when we assert that the planting and successful cultivation of fruit trees, and securing a good supply of the best fruit the year round, will do more towards adding to the real as well as the market value of their places than can be accomplished with the same outlay in any other manner. We ought, perhaps, to add that a portion of ornamental planting should not be omitted; for while fruit trees are valued by every one, the addition of a portion for shade and ornament will certainly increase the attraction given by the more substantial and higher market value of fruit trees and their products.

A purchaser visits a certain neighborhood to select a farm. One of his first inquiries is, is it well planted with fruit? If an affirmative answer can be given, he may be induced to pay several dollars more per acre, amounting to five hundred or a thousand dollars for the whole farm—while the trees and planting have not cost more than one hundred and fifty.

There is another consideration of a higher character, namely: the influence of home attraction to the owner's children—an attraction which may prove the turning point between a life of usefulness, industry and domestic enjoyment on the one hand, and of a roving, restless, and perhaps immoral character on the other. But our object at the present moment is to point out the money value of these improvements. The farm will bring a higher price, because it is worth more. Fresh fruit, constantly on hand, will save many dollars yearly in family supplies, and the surplus may perhaps yield a few hundred dollars by marketing. But there is still another point of profit. The owner probably has boys whom he has endeavored to educate to usefulness, and who he expects will assist him when they grow up, and perhaps take charge of the farm. Now let him figure for a moment between the amount which he would be likely to realize in ten years from his land, if he should be compelled to do all his work, and a part of the superintendence by means of second or third rate hired men on one hand, or through the energetic and careful management of his own sons, in the prime and vigor of their manhood, on the other. If farming is made repulsive to them by placing them on a piece of land without a single fruit or ornamental tree, and which will only raise crops of wheat and corn, they will

be likely to leave the pursuit and try their hands at trade or speculation, or something worse.

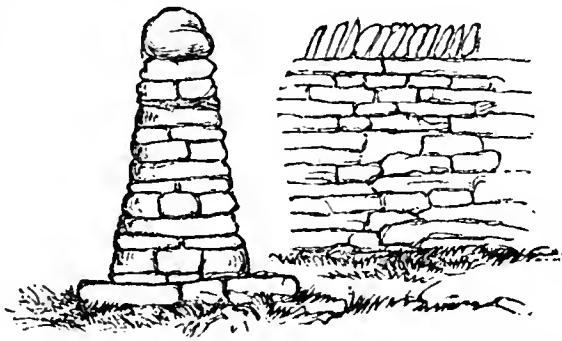
It happens, unfortunately, that many who admit the value of plantations of fruit trees, do not use the right means for securing their best advantages. Trees are planted without order or method, scattered in various places where the ground can be best spared for them—along lines of fences, or in corners of door-yards, where it is impossible to give them adequate cultivation. They are overgrown when young, with weeds and grass, and make but little progress; and perhaps their struggles for existence are ended in a few years by the girdling of mice. All this failure might be prevented by selecting, not the worst piece of ground, but the best that can be had for the fruit garden. In order to prevent the incursions of still another enemy—namely, fruit stealers—the piece of selected ground, which may be from two to five acres in extent, should be surrounded by a thorny hedge. This hedge may be Osage Orange, where the climate is not too severe; or honey locust, in colder latitudes. Let this hedge be well made by planting evenly, in well prepared mellow soil, uniformly selected and healthy plants, to be cultivated well for several years, and properly cut back, so as to produce a thick and impenetrable barrier. If this hedge is planted with the fruit trees, it will be of sufficient size by the time they come into good bearing. The inclosed ground will have vacant space enough for garden vegetables and melons, and the latter will be secured from pilferers by the surrounding hedge.

Such a fruit garden as this, properly filled with well selected and thoroughly cultivated trees, would be a source of profit as well as enjoyment almost beyond estimate. Fresh fruits on the table from the first or second week in summer till the following spring, after having been once enjoyed, would not be readily parted with by any intelligent cultivator. The pruning, training and general charge of such a plantation would furnish delightful employment to boys, young men and the veteran farmer. Propagation by grafting, budding and layering, and by seeds, would always afford amusement and instruction. Even an acquaintance with insects and other depredators would add to the interest, in connection with the study of Natural History.

To recur to a remark at the beginning of this article—suppose a farm purchaser desires to find a place to settle—would he not be far more likely to select a neighborhood or region of country where such admirable provisions for comfort as we have described could be found on every hand, than in a neighborhood where there is little intelligence, where everything of the kind is disregarded, and where rough grounds and rough farms, without the ornament or luxury of a tree, are only to be seen? A moment's reflection would satisfy any one that nothing could add more to the pecuniary value of the land in such a region than the general adoption of the improvements we have recommended. We trust that those who have heretofore failed to give sufficient practical attention to this subject, will now determine that another season shall not escape without their commencing the work in earnest.

STONE WALLS.

GOOD SPECIMENS OF STONE WALLS are found on the farm of GEO. GEDDES, near Syracuse, N. Y. The water limestone which underlies this farm furnishes abundant quarries of an excellent building stone, which has been used to great advantage in the construction of the farm fences—many miles of which have been built, forming excellent and durable subdivisions of the fields. These walls are about five feet high when completed, but settle a few inches into the soil in the course of years. To prevent this settling, and also to preserve from distortion from the effects of frosts, the walls are built on broad flat stones, (which this rock supplies in abundance) projecting a few inches on each side from the bottom. Fig.



1 represents a cross section of this wall, showing the flat base stones with the wall resting upon them. It is about two feet thick at bottom, and one foot at top, and is surmounted with what is termed Scotch coping—made by placing flat stones on edge, in a sloping position, as shown at the right hand of the engraving. It will be observed from the section that a sufficient number of broad, flat stones are placed in the wall to extend through it and bind the parts well together. The rock is so easily quarried, that, before the war, it was done for about twelve and a half cents for a cubic yard. The builders are now paid a dollar per rod in length, and the additional expense of delivering the stone on the ground hardly brings the whole sum up to two dollars per rod.

The farm of E. B. UNDERHILL of Westchester Co., N. Y., furnishes fine specimens of stone wall building. While many others on adjacent places were distorted or tumbling down from the effects of frost, all these remained straight, even and perfect—being set in sufficient trenches filled with small stone, on which the walls were built. In mucky or wet places these trenches in some cases were several feet deep, affording drainage to the land, as well as support to the walls resting on them; the larger blocks of stone, many of them weighing one or two tons, were placed at the bottom, which was generally three feet and a half to four feet thick—the top was two feet thick, and finished with flat stones extending across. The height varied somewhat with the surface of the ground, so as to make the top a smooth, straight, or handsomely curving line. Some of these walls had been built thirty years, and remained even, unimpaired, and unaffected by frost.

Fig. 2 represents imperfectly the manner in which the joints are

carefully broken in building these walls ; and fig. 3 is a cross section of the same. Figs. 4 and 5 show respectively, badly broken joints, a few specimens of which are occasionally seen elsewhere. I estimated the

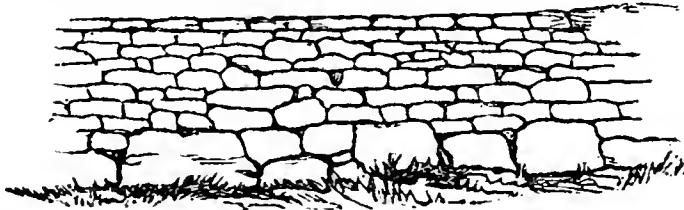


Fig. 2.

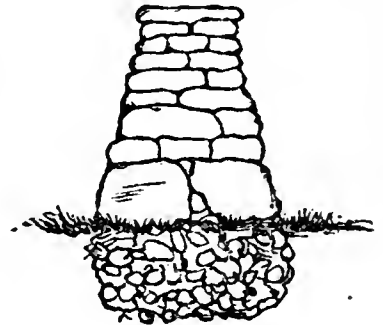


Fig. 3.

whole of these farm walls over five miles in length. Being of granitic character, they are not so easily worked as softer stone, but are more perfect and durable. The cost of laying has been about three dollars per rod,

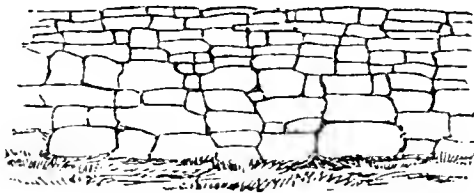


Fig. 4.

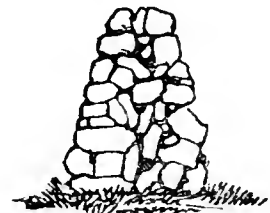


Fig. 5.

in addition to drawing off the land. The cost would be more at present prices. During the early part of the war, when labor was cheap and owners were afraid to expend much capital, the proprietor of this place employed a considerable number of men, and made some of his best improvements.

WALL AND BOARD FENCE.

In many localities it is desirable and convenient to build a fence, the lower portion of which is stone and the upper of boards. I do not know of one that possesses so many advantages as the one shown herewith. The

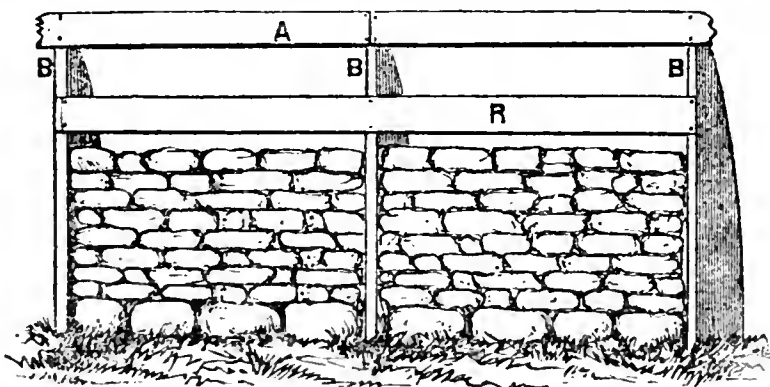


Fig. 1.

posts, B B B, are made from plank 2 inches thick and 1 foot wide, and of any length to suit the height of the fence. The portion above the wall is tapering, as shown in fig. 1. R is a board six inches

wide, the lower edge of which is nailed on the post, two and a half feet

from the ground. A is a board four inches wide, and placed eight inches from the lower one.

Directions for Building a Fence.—First, set the posts B in the ground ; two feet will be about the depth ; nail on the boards, or the upper one at least, when you are ready for laying up the wall. The nearness of the posts to each other and the width will enable you to use a great many round or cobble stones in its construction, with a certainty of their remaining.

The superiority of this fence over the common round post and wall fence, consists in—1. The wall never falls or tumbles down around the post, as they are laid between, and not around the posts. 2. The post *never* heaves by the action of the frost, as the stones in the wall hold it with the power of a vice, so to speak. 3. I consider this the only cheap and durable plan by which a half wall fence can be constructed, and it looks neat and is substantial, as I can testify from examination.—L. D. SNOOK, *in Co. Gent.*

RURAL ECONOMY.

TO MAKE WAGONS AND CARRIAGES LAST LONG.—Keep them clean and well screwed up. A carriage allowed to become dirty, loses its paint, cracks, admits water and decays. If dirt is permitted to collect on the hubs, it works inside, mixes with the grease, and grinds out the works. The wheels soon work loose and the evil increases. If the nuts work loose, the parts rattle, wear out, or break. Place a wrench on every nut, if the wagon or carriage is in use, as often as once a week. Keep all parts well washed, well painted, and well varnished. Always place them under shelter when not in actual service.

LEAKS IN ROOFS.—During hot, dry summers, wood contracts, and leaks are often made in roofs. The trap-door at the house-top was thus made to leak badly. The carpenter proposed to batten it ; but the writer directed that white lead paint, having enough fine, clean sand mixed with it to become about as thick as buckwheat batter, or thin mortar, should be put in the cracks, and not a drop of water has since passed them.

WEEKLY EXAMINATIONS.—Every farmer should so arrange his work that he can spare time enough once a week to go all through his barns and outbuildings, and see if anything is out of order. The best time is at the beginning of the week, for he then has no unfinished jobs on hand that must be completed before the Sabbath. In one place he will find a door with a broken hinge ; in another a sleigh standing on damp earth ; and again he will discover a tub with a hoop falling off, &c. “It will take much time ?” Then take it—it will be the best spent hour, or half day, if necessary, that the owner spends. If he cannot make repairs on the spot, take his memorandum book in hand, and note everything requiring attention ; and he can then call on a mechanic.

BALKY HORSES.—They refuse to move forward, with a dogged obstinacy, and seem to say, "I would rather go backward—I shant stir forward a step." Take them at their word; hitch a team to the back end of the wagon, and start up in the reverse direction, drawing the balky animal in the way of his choice. He will soon regard it as a poor joke, and prefer going ahead in the natural way.

FACING BOARD FENCES.—A valid objection is made to the practice of nailing upright facing strips of board against the posts, after the horizontal boards are on—that they retain water, and cause the ends of the boards to rot before the rest. A better way is to omit the facing for many years, or until decay begins on the inner side of the boards next the posts, in consequence of the water retained on that side. After the boards have become loose, and have been repeatedly nailed on again, then is the time to apply the facing. Any strips of board about four feet long, and four or five inches wide, will answer. We have known fences that had stood about twenty years unfaced, and then begin to give out, made strong and firm for several years more by facing.

LOADS FOR TEAMS.—Teams are sometimes permanently injured by overloading, in consequence of an ignorance of the quantity of some new material to make a ton. Every person, or at least every owner of a team, should therefore acquaint himself with the relative weights of different materials. With straw no one need have any fear, and hay is next—a load of timothy twelve feet long, seven feet wide, and six feet high, well packed, weighing about a ton, or about 500 cubic feet in a solid stack or mow. Four and a half cubic feet of iron weigh the same, and a wagon box ten feet long and three feet wide, should therefore be filled only two inches to make over a ton. Sand may be put in the same wagon box to a depth of 10 inches, moist earth 9 inches, loose gravel 11 inches, and brick about 9 inches.

FREEZING PUMPS.—Pumps exposed to freezing are now usually made with contrivances to let off the water—one mode being to make a small hole in the pipe a few feet below the exposed part, so that the water will always run off before freezing. This hole may be stopped at other times of the year. Another way, which may be adopted for any pump, is to place a small nail or carpet tack under the leather of the fixed valve, which will cause it to leak and let off the water. It is well where pumps are liable to freeze to keep a small lead pipe or other tube, with a funnel, always on hand. Place this tube on the ice in the pump, and pour in hot water at the top. The tube carries the hot water directly on the ice, and it melts with great rapidity—a foot or more a minute—ten times faster than in any other way.

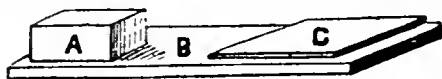
PROFITS OF PLANTING.—A few far-seeing, shrewd land owners are now making extensive plantations of timber. Others will follow in twenty or thirty years, and say—"We are twenty or thirty years too late. If we had planted then, we might have had a fortune now." Timber will be no cheaper. The Duke of Athol, as is well known, made vast plantations of timber—over 10,000 acres, in Scotland. It is now asserted that the timber from these trees would bring, if sold under the hammer, the enormous sum of \$50,000,000.

GOOD AND POOR HORSES.—It costs no more to keep a good horse, one that will do a heavy day's work with ease—than a poor one with more bone than muscle, and hard to keep in order. A good, well chosen team, compactly built, easy keepers, &c., well taken care of, will do one-half more work each day than a bad or common team. Good horses will, of course, pay the interest on the whole cost several times over, and be far cheaper than the others. It will therefore do to pay a hundred dollars or more additional on them. A man, whose labor costs \$300 for the season, will accomplish far more with the fine animals than the cheap ones.

BINDING CORN FODDER.—The strongest and cheapest material for binding up stalks, is the osier willow. The true sort, used by nurserymen, is almost as tough as rope. It grows easily from cuttings on any rich soil. A row of it two or three rods long, occupying not one square rod, will afford enough to bind ten acres of corn. It should be cut back to the ground every autumn, or else very early in spring, to keep it young and fresh.

DOMESTIC ECONOMY.

ANNEXED IS SHOWN AN IMPROVED KNIFE-BOARD. The board B is three feet long by one and a half wide. A is a scouring brick made from fine clay—an excellent article for the purpose—can



Knife-Board.

be had at all grocers'. C is a piece of buff leather nailed or firmly attached to the board as shown. It is well to nail a half-inch strip on the edge of the board, to prevent the sand, &c., from falling off.

This board occupies but little space, is cheaply and quickly made, and will be found to answer the purpose admirably. A high polish can be given to the knives by a few strokes over the leather.

PULVERIZED CHARCOAL is an excellent remedy for many purposes, and should be kept in every house. A glass jar with a wide mouth, and cork to fit it closely, is best to keep it in. A half pint or so is large enough for most practical purposes. The coal should be freshly burned, and of such a character as to pulverize finely in a mortar, without leaving grit. Most kinds of *hard wood* are too hard, and bass-wood and pine are too soft and dusty. We have never found anything equal to the "white wood" of New-England, or the Tulip tree. Perhaps soft maple would do. Take a stick large enough to make the desired coal, place it in the fire till it just ceases to blaze, and then pound or bray the red coals in a mortar—which will, of course, immediately extinguish the fire. Place the powder in the jar or bottle, and keep it corked tight. It is excellent for indigestion, or any derangement of the stomach—a rounded teaspoonful is a full dose, and should be mixed with several times its bulk of water, and swallowed. The powder is excellent to rub the teeth with daily. We once tried it on a six months calf that had become fearfully bloated from over-eating green food.

Saleratus was first given, but it could not be swallowed. Half a teacup of charcoal in water was then administered without difficulty from a junk bottle, the head being held up. In six hours the animal was perfectly well. All agreed in the opinion that without this treatment it would certainly have died.

WHEN A HOUSE TAKES FIRE remember that the first thing is to *close all doors and windows*. This prevents currents, and prevents the fire from spreading from room to room. A neighbor's fine two-story dwelling was found on fire in the dead of night, and the family, scarcely dressing, ran frantically through the building, leaving all the doors open. In ten minutes all was a sheet of flame. Had the doors been kept closed, the fire might have been perhaps checked till it was extinguished, or at least admitted the removal of furniture. Remember then, and impress it strongly and vividly on the mind, as soon as a house takes fire, to *keep the doors closed*.

WHEN A CHIMNEY TAKES FIRE from a superabundance of soot, and danger is threatened, throw salt or a wet blanket on the fire below, and close it above and below to prevent a strong current of air, and it will burn out the soot slowly.

AVOIDING COLD WINDS.—Those who have to ride in cold winds in winter, and who do not happen to have sufficient clothing at the time, may protect the lungs or chest by placing a doubled newspaper in front, and then buttoning the coat over it. It will be found to have a remarkable protecting power against the cold. Those who do not happen to have sufficient bedding, and who take some one of the great blankets called fashionable newspapers, may protect themselves on very cold nights, by spreading one or more between the quilts. Travelers should take a few with them for this purpose.

OILING CARRIAGES.—The oil used for this purpose should have body enough to last some time, and for this reason castor oil is one of the best. In applying it run the oil can lengthwise with the axle, on the top, and put a little in the oil chamber in the box. If the axle is always wiped clean before applying the fresh oil, it will remove grit and make it last longer. A person who has used lard a great deal for iron axles, thinks that although it runs off rather slower in hot weather, it is not so lubricating as castor oil.

LOOSENING SCREWS AND STOPPERS.—A knowledge of the fact that bodies expand by heat, and an application of this knowledge, will often save much trouble. Ground glass stoppers in bottles often become fast by being put into the necks after the latter are warmed by the fingers, the stoppers being cold. To loosen them, warm the necks by applying a small cloth dipped in hot water, which will expand it and loosen the stopper. Nuts on thrashing and other machines sometimes become immovable by being put on the screws in cold weather after the nuts have been warmed by holding in the hands. The only way to get them off is to expand them again by heating. The work should be quickly done, otherwise the screws will also become heated and expanded. We once saw three strong men trying to unscrew a rusty iron pump. We suggested heating the outer or hollow screw, when it was loosened with one hand.

CANE MILLS.

SINCE IT HAS BECOME SO COMMON WITH FARMERS to manufacture their own molasses in the form of sorghum, some good contrivance for expressing the juice has become very desirable. Fig 1

represents a sugar mill of the kind, to be placed over a barrel and driven by hand. The fly wheel makes the work comparatively easy. The hopper is represented as lifted off to show the rollers and gearing. The whole, without the barrel, holds about ninety pounds. The rollers are about eight inches in length, and four in diameter. This mill is mostly intended for common sugar cane.

For expressing the juice of the sorghum by horse power, which is generally adopted, the horizontal mill represented by fig. 2, answers a good purpose, and is one of the best in market. It possesses the advantage of convenience in feeding, with strength, lightness and

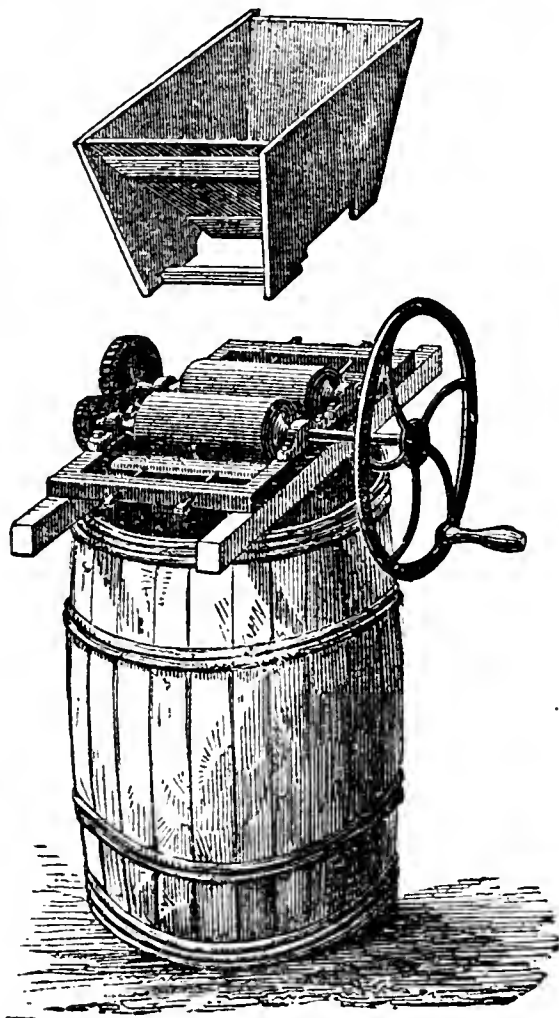


Fig. 1.

cheapness. The rollers are about ten inches in diameter. It will be found useful in the South, and all sugar raising countries where only a limited quantity of cane is ground. The mill is made of three sizes, with wood or iron frames. The cut shows the medium size. The entire weight of this size is six hundred pounds.

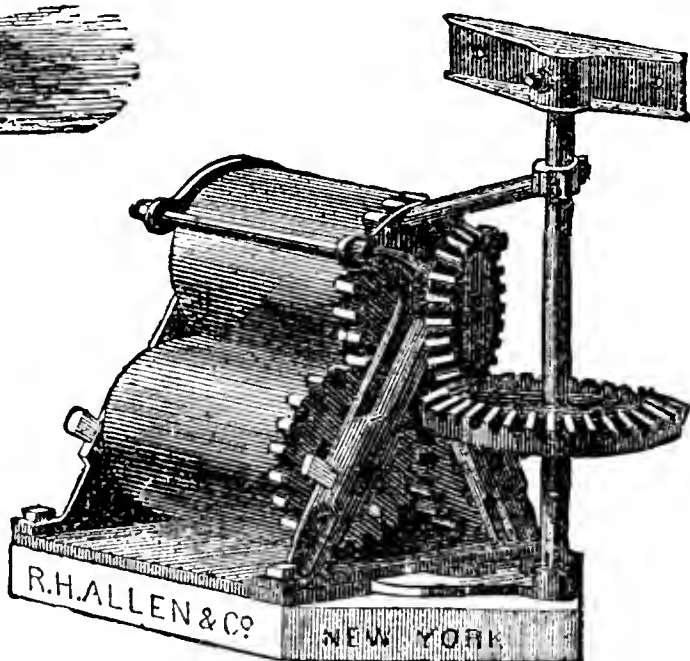


Fig. 2.

ARITHMETIC IN FARMING.

A FREER USE OF THE MULTIPLICATION TABLE would enable farmers to act with more precision in many operations now conducted entirely by guesswork. We have frequent inquiries, for example, as to the proper amount of certain special manures to be applied per acre for different crops; but the use being new, the application is made without any guide as to quantity, and too much is used in one case, and too little in another. One man injures his crop and wastes the material by overdosing; another uses too little, and does not witness any sensible effect. A little figuring would obviate these difficulties, and enable the farmer to calculate accurately beforehand just how much to apply. Suppose, for instance, that he proposes to use superphosphate at the rate of 500 pounds per acre in his turnip-drills. Instead of trying at random, and coming out wrong, as he will be sure to do, let him bring his work down to figures, in the following manner: His drills, we will suppose, are 28 inches apart, amounting to 1120 rods in length on each acre, or at the rate of about seven ounces per rod. Or, to be more accurate, as well as to take a more convenient length, the fertilizer should be strewed along the furrow at the rate of one ounce to two feet and two inches in length. Weigh out a small quantity in ounce portions, and practice it a few minutes by strewing it along a furrow so that each ounce shall reach a measured length of two feet and two inches. A little practice will enable the operator to apply the fertilizer so that he can distribute the required quantity over the acre or field with much accuracy. If he wishes to use only half this quantity, or two hundred and fifty pounds per acre, strew it so that an ounce shall extend four feet and four inches, and he will accomplish the desired purpose.

If a fertilizer is to be applied in hills, as in a cornfield, a similar mode of calculation may be readily adopted. Hills three feet and a half apart each way will be at the rate of about 3500 per acre, requiring about two ounces per hill, if 500 pounds of the fertilizer are used, or one ounce for 250 pounds.

In sowing plaster by hand at the rate of a bushel or 100 pounds per acre, the operator should only take the tenth of a pound for each handful, for if he covers a space five by ten feet at each throw, it will take nearly one thousand to go over the acre, as a little figuring will prove.

The same mode may be used to determine the amount of grass seed for each handful in sowing broadcast. Each throw will cover, as before, from five to ten feet, and whatever quantity is used for an acre should therefore be divided up into about a thousand parts. A peck of clover seed, for example, weighs fifteen pounds, and to cover an acre, each handful should be a little less than the fourth of an ounce. The previous use of a pair of scales for weighing off a few of these portions would enable the operator to hit at once, with considerable accuracy, the right quantity, in-

stead of being compelled to make random guesses for days, or even years, before acquiring proper experience.

It is often regarded as an indication of shrewd guessing when the farmer brings his domestic animals through winter on the exact supply of fodder which he has stored away for this purpose. Sometimes he may find towards spring that he has many tons of surplus, and perhaps, more frequently, that he has to purchase a considerable amount in order to "piece out" the winter supply. Measuring, weighing and calculating, the work of a few minutes, will obviate much of this uncertainty. The farmer who frequently weighs a load of hay acquires sufficient experience in estimating, to determine very nearly, from a record of the size and number of the loads which he draws into the barn, the whole amount which he has on hand for winter. If he has neglected to do this, he may hit the amount nearly as well by measuring his bays and allowing an average of 500 cubic feet per ton of timothy, 600 feet if part clover, or 700 feet if all clover. He will thus be able to learn, very nearly, how much hay he has on hand. The next question is to know how much his animals will eat. If he has provided good racks, to prevent them treading hay under foot, and has given them fair shelter, he may adopt the following rule with a good deal of certainty: Determine the weight of his animals, and allow three per cent. of the weight of his horses for their daily food in hay, and two and a half per cent. for cattle. Multiply this daily allowance by the whole number of animals, and again by the number of days which he expects to give them dry food, and then compare it with the quantity on hand, and he may strike the balance, one way or the other, with considerable certainty.

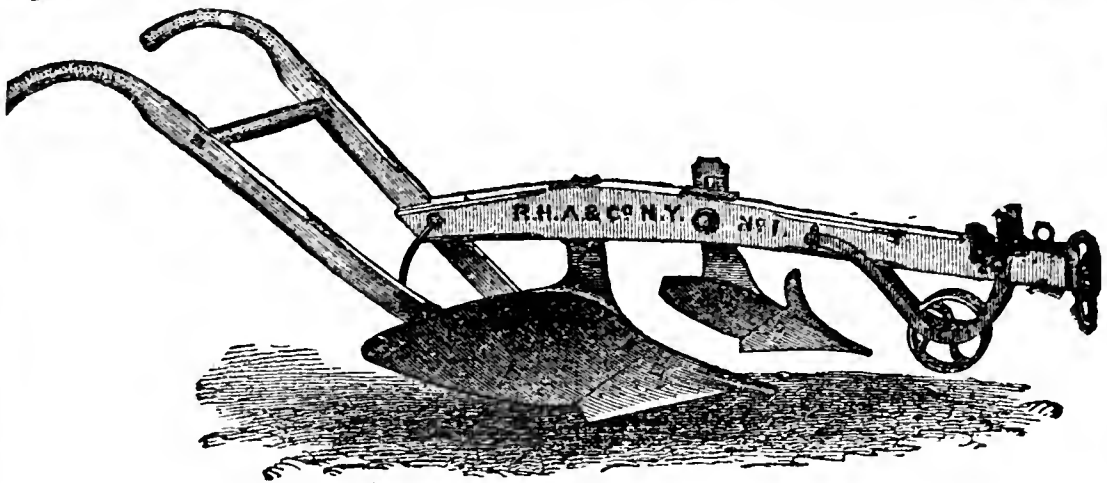
Every farmer should have a tape line, or other means for measuring his fields. If he has had much experience in pacing, he may indeed make temporary measurements with some degree of accuracy, but he should frequently correct such rough work with the tape line. A cord or garden line will do tolerably well to measure with, provided its length is frequently corrected by the use of an accurate ten-foot pole, and taking care that it is not shortened afterwards by dragging through wet grass, or lengthened by stretching, or by exposure to a hot sun on a dusty surface. Pieces of red yarn may be sewed through it to mark rods and feet. Every field should be measured, so that the owner may know the number of acres, and a record should also be made of its length and breadth, that the amount of land plowed in a day may be readily reckoned, and the contents of each "land" definitely known. Among other advantages, this accuracy will enable the owner to determine easily acreable products under different modes of management, and to acquire a great deal of valuable information in a few years as to the most profitable way of raising heavy crops.

There are many other modes, which will suggest themselves to the intelligent farmer, for adopting the weighing and measuring system, and submitting his work to accurate figures, instead of to loose and random guessing. Every granary should have a graduated scale inside, to show

at a glance the number of bushels at any height. A similar measurement and record should be made of his wagon boxes. These he may do by measuring the length, breadth and depth for the cubic feet. Then divide the number of cubic feet by 56, and multiply by 45, and the result will be struck measure. Or he may allow 2,150 cubic inches for each bushel, or add one-fourth for heaped measure, as for potatoes, corn in the ear, &c.

PLANTING CORN IN DRILLS.

OUR READERS are aware that we have occasionally urged the superiority of the practice of planting corn either in drills or in small hills thick in the row, where the highest amount of product is the object. The average increase, in a number of observations and experiments in drill or thick hill planting, has been about 25 per cent. John Johnston says that this increase much more than overpays the slight additional cost of labor in hoeing, and nearly doubles the cornfodder. We find our views endorsed in a recent article in the Clyde Times, with the signature of "W.," which we recognize as that of Joseph Watson, well known as an intelligent and successful farmer. He states that he has used Emery's corn planter for twenty years, and finds it a labor-saving implement, planting eight acres a day, and enabling him to put in his crop promptly and in season, even if there happens to be at the time a scarcity of farm laborers. He remarks that the object of planting rows both ways, is not equal in practice to the importance attached to it in theory, and then adds some reasons of the "row-one-way system," in addition to those which we have formerly given, and which necessarily result from the use of a planter or drill. He states in substance that while the plowing of the sod is going on, which should be done with a strong team, a lighter team may be employed to harrow the freshly turned earth as fast as each "land" is completed, and the corn planter follow immediately after. This obviates the necessity of waiting till the whole field is completed for cross working and planting in the old fashioned way—when the soil, perhaps, has become dry, and many days lost by the delay. The rows thus planted by means of the drill will be either straight, or contain no short crooks; and hence the cultivator may be run close to the rows, and lessen the amount of hand-hoeing. Another advantage is, the hoes may follow immediately after the cultivator while the earth is fresh and mellow; and any stalks accidentally covered are immediately relieved and set up, without leaving them partly prostrated several days, as in the old practice, until the cross cultivation is commenced. He further adds that he prefers the drill with its one horse, to any five men planting by hand and hoe, even after the whole field has been marked both ways; and that none of his neighbors raise greater crops of corn or at so little expense per bushel.



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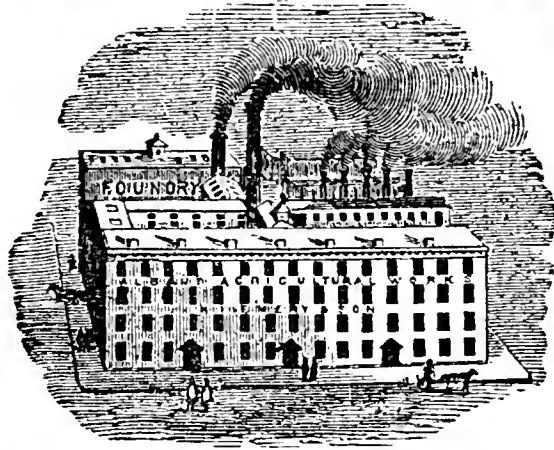
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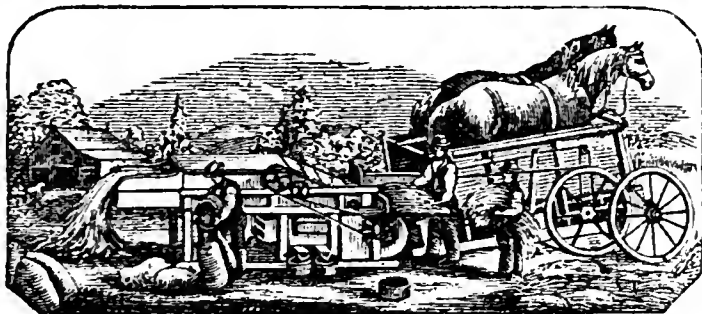
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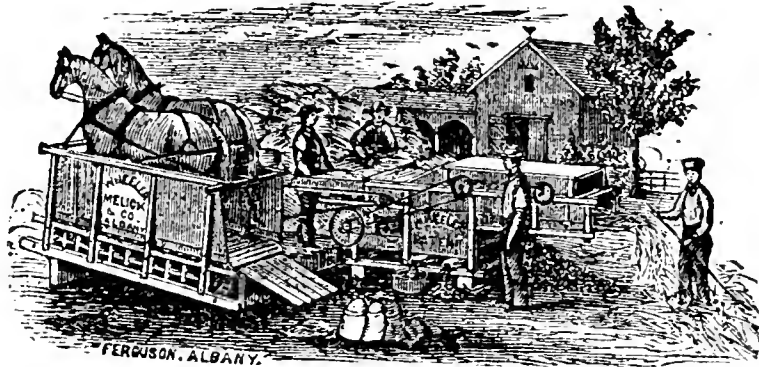
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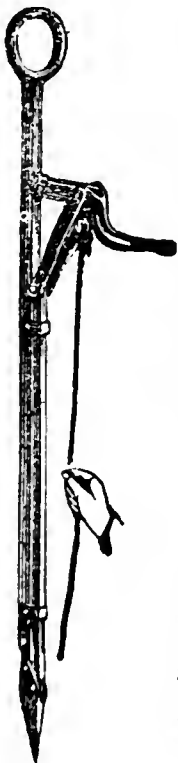
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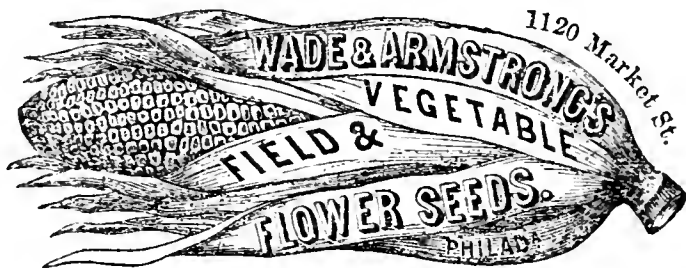
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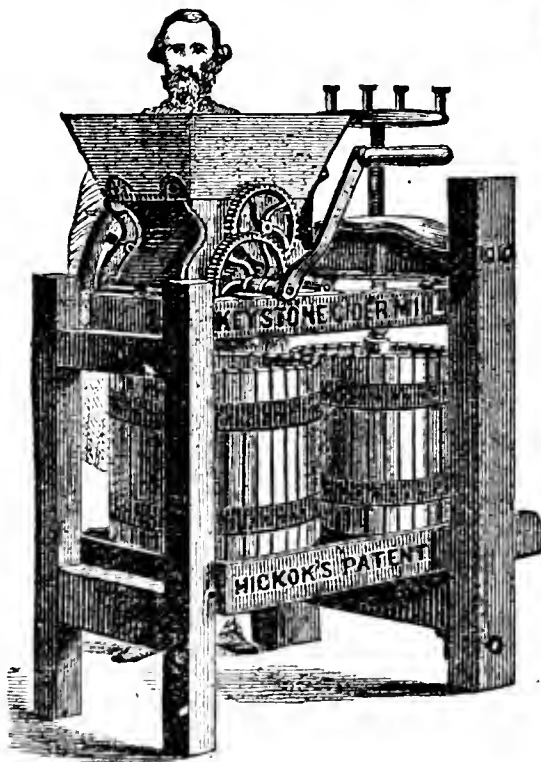
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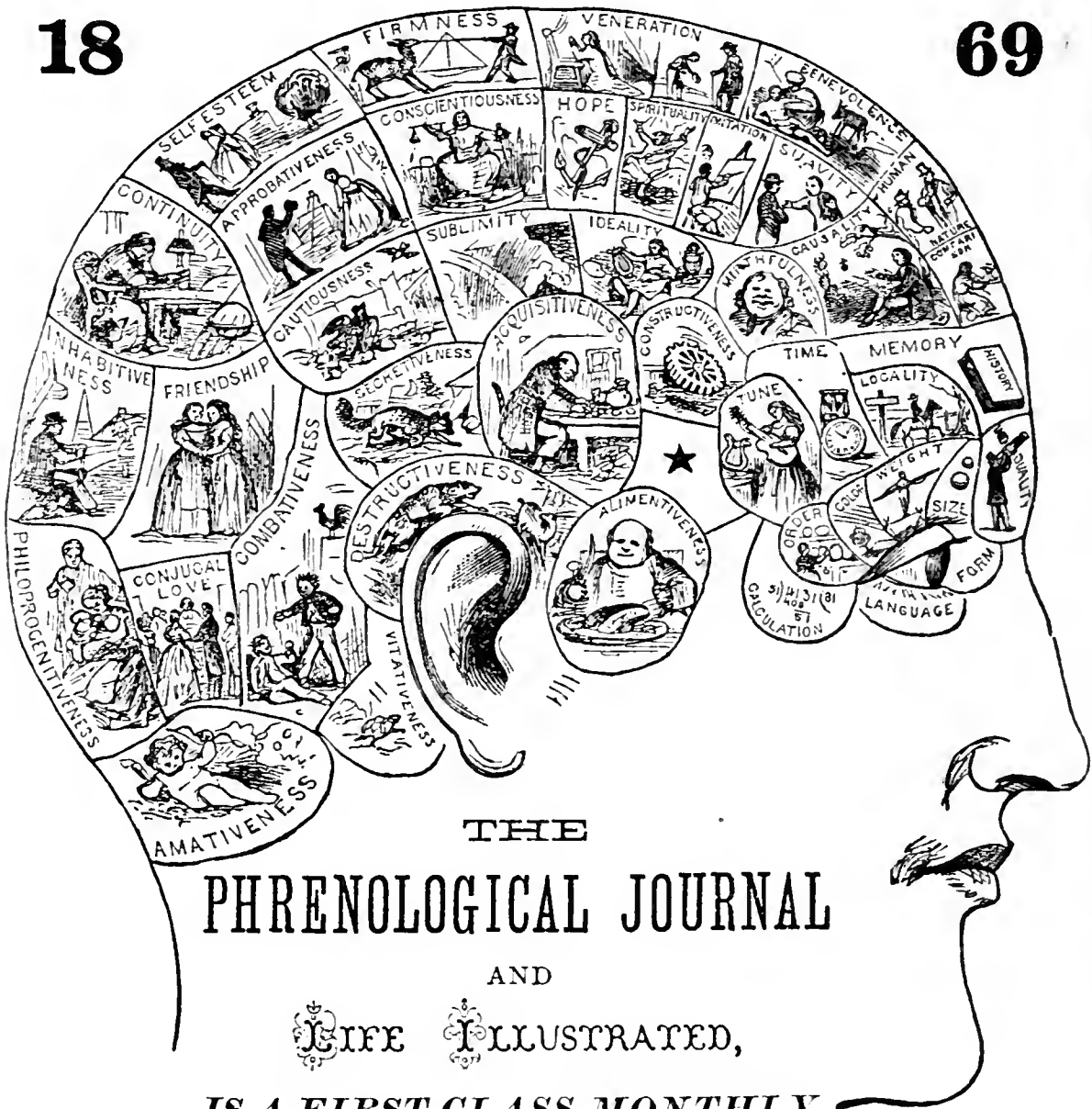
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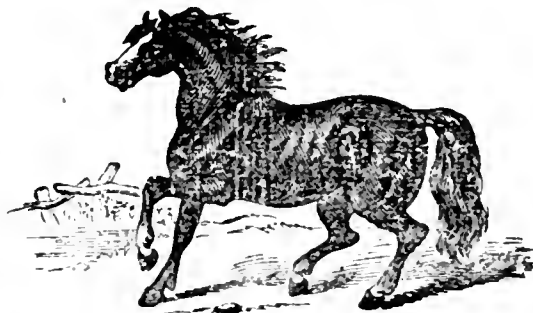
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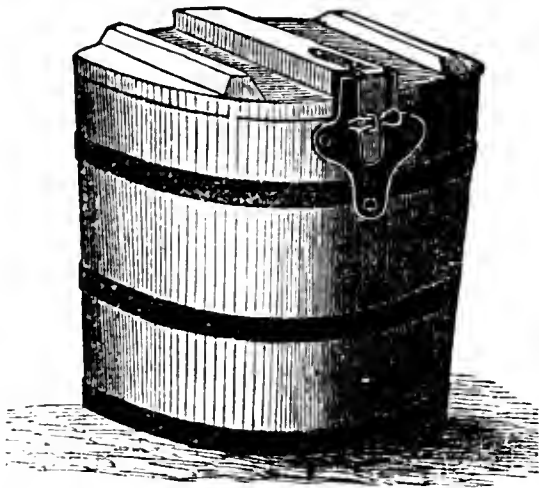
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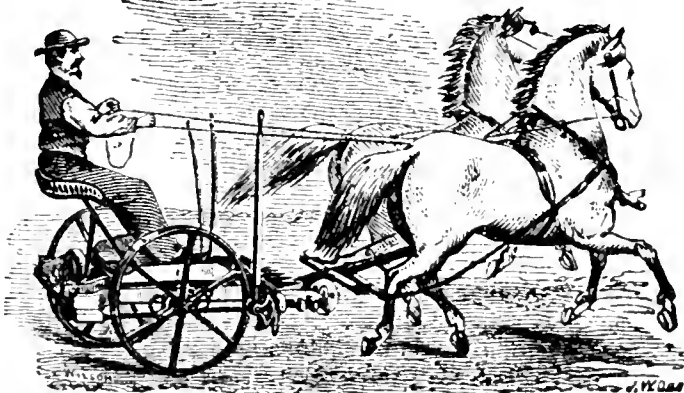
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