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## **Transactions of the Northern Wisconsin Agricultural and Mechanical Association, including the full report of the industrial convention, held at Oshkosh, Wis., March 1877. With other practical papers. ...**

Northern Wisconsin Agricultural and Mechanical Association  
Madison, Wisconsin: David Atwood, Printer and Stereotyper, 1877

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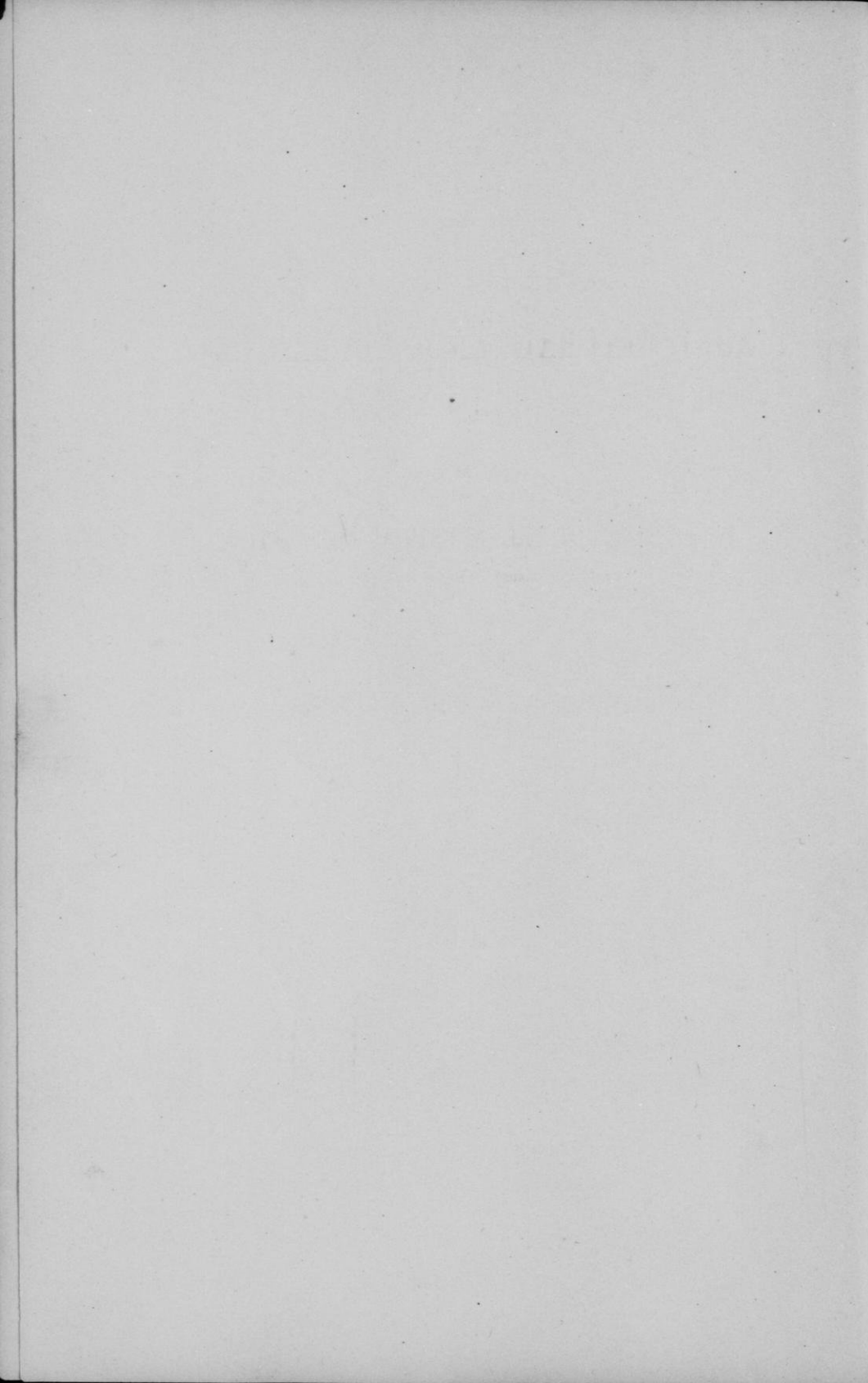
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Mr George C. Hill  
Rosendale-  
Grand du Lac Co.  
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AGRICULTURAL  
EXPERIMENT STATION,  
MADISON, WIS.



TRANSACTIONS  
OF THE  
NORTHERN WISCONSIN  
AGRICULTURAL AND MECHANICAL  
ASSOCIATION,  
INCLUDING THE  
FULL REPORT OF THE INDUSTRIAL CONVENTION  
*Held at Oshkosh, Wis., March, 1877.*  
WITH  
OTHER PRACTICAL PAPERS.

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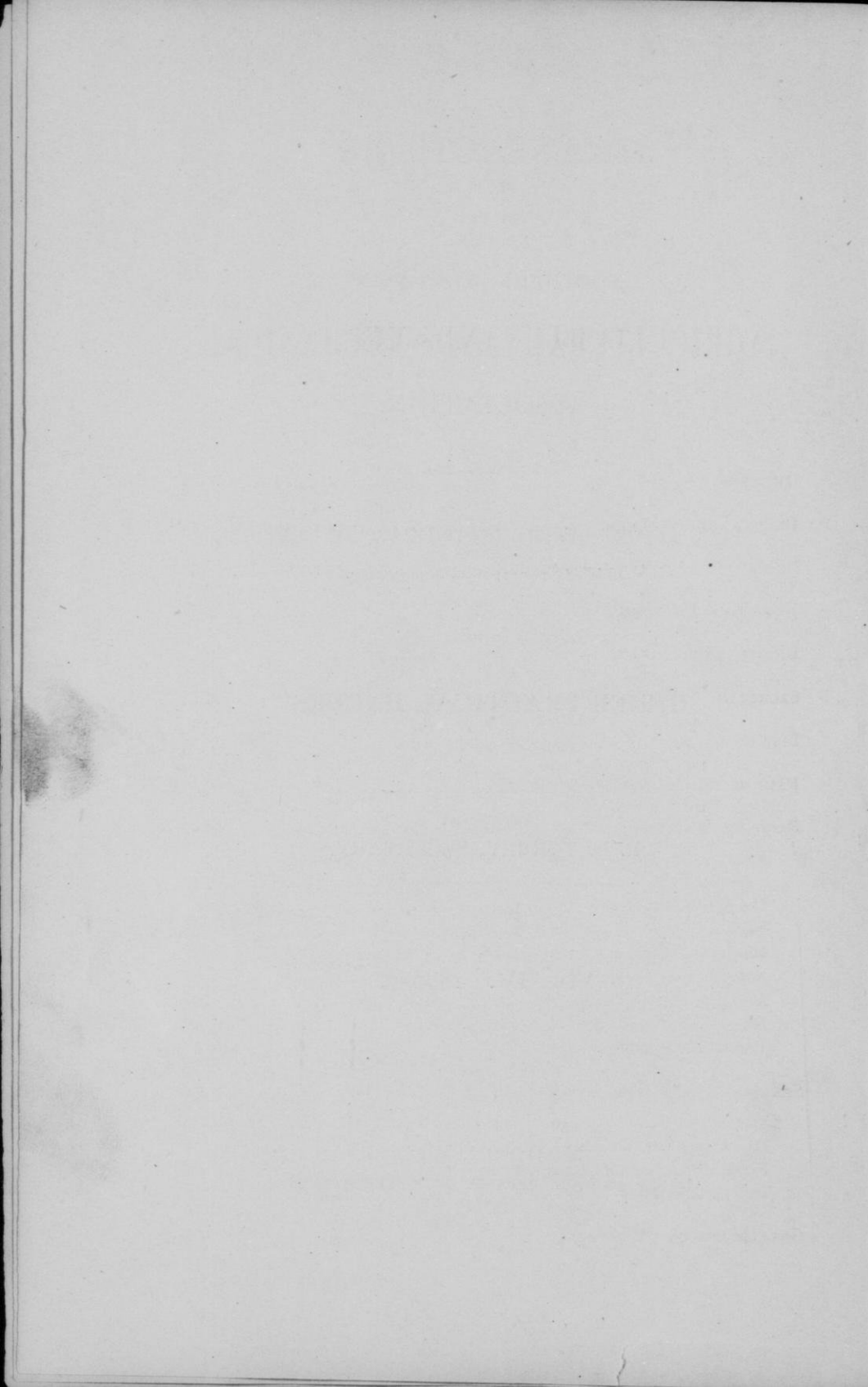
COMPILED BY  
R. D. TORREY, SECRETARY.

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VOL. IV. 1876-7.

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MADISON, WIS.:  
DAVID ATWOOD, PRINTER AND STEREOTYPER.  
1877.



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## OFFICERS FOR 1877.

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### PRESIDENT.

A. A. LOPER, RAPON.

### MARSHAL AND CHIEF OF POLICE.

F. M. POWERS, OSHKOSH.

### SECRETARY.

R. D. TORREY, OSHKOSH.

### TREASURER.

CHESTER HAZEN, LADOGA.

### VICE-PRESIDENTS.

DANA C. LAMB, Fond du Lac.	CHAS. McCONNELL, Dartford.
K. M. HUTCHINSON, Oshkosh.	J. H. FELCH, Amherst.
D. HUNTLEY, Appleton.	H. E. ZIELLEY, Chilton.
JONATHAN STODDARD, Greenbush.	

### SUPERINTENDENTS OF DEPARTMENTS.

<i>Horses —</i>	<i>Farm, Garden and Dairy —</i>
H. B. DALE, Oshkosh.	D. HUNTLEY, Appleton.
<i>Cattle—</i>	<i>Fruit and Flowers —</i>
M. C. BUSHNELL, Omro.	GIB LANE, Oshkosh.
<i>Sheep —</i>	<i>Domestic Manufactures and Fine Arts—</i>
E. R. MARTIN, Omro.	D. C. LAMB, Fond du Lac.
<i>Swine and Poultry —</i>	<i>Manufactures —</i>
J. O'BRIEN, Nekimi.	J. STODDARD, Greenbush.
<i>Farm Implements and Machinery—</i>	
H. E. ZIELLEY, Chilton.	

### BOARD OF CONTROL.

K. M. HUTCHINSON, Oshkosh.	D. C. LAMB, Fond du Lac.
R. D. TORREY, Oshkosh.	D. HUNTLEY, Appleton.
J. STODDARD, Greenbush.	

## LIFE MEMBERS.

---

Austin, A. C.....	Oshkosh.	Martin, E. R.....	Omro.
Abrams, Wm.....	Nekimi.	Mayhew, Leander.	Greenbush.
Brainerd, A. W....	Oshkosh.	Mears, Q. W.....	Vinland.
Brainerd, James,..	Oshkosh.	O'Brien, J.....	Oshkosh.
Brainerd, E. M....	Oshkosh.	Osborne, A. K....	Oshkosh.
Catlin, W. S.....	Elo.	Olcot, J. B.....	Oshkosh.
Cotton, M. F.....	Oshkosh.	Pinning, B.....	Oshkosh.
Chase, L. S.....	Oshkosh.	Paust, P. T.....	Appleton.
Dale, H. B.....	Oshkosh.	Padelford, S. D...	Omro.
Dale, J. W.....	Omro.	Quick, H.....	Elo.
Daubner, G. H....	Brookfield Center	Rogers, George...	Oshkosh.
Fester, Carlton...	Oshkosh.	Robinson C. D...	Green Bay.
Gardenier, John...	Little Wolf.	Rogers, A.....	Oshkosh.
Goe, T. R.....	Oshkosh.	Stilson, Eli.....	Oshkosh.
Hicks, J. H.....	Oshkosh.	Sherwood, J. C....	Darford.
Hawley, A. W.....	Waukau.	Suydam, Fred....	Oshkosh.
Heath, Irwin.....	Oshkosh.	Sanders, E. W....	Oshkosh.
Hall, William.....	Medina.	Sawyer, P.....	Oshkosh.
Hart, A. H.....	Appleton.	Servis, William...	Sheboygan Falls.
Huntley, D.....	Appleton.	Stoddard, John'thn	Greenbush.
Jackson, H. B....	Oshkosh.	Smith, J. M.....	Green Bay.
Jennings, W. J....	Rosendale.	Stephenson, Isaac.	Marinette.
Keyes, George....	Empire.	Stilson, Edgar....	Oshkosh.
Lampard, G. R....	Oshkosh.	Torrey, R. D.....	Oshkosh.
		Thompson, L. F...	Oshkosh.
		Wade, A. B.....	Oshkosh.
		Wilson, M. C.....	Oshkosh.

## CONSTITUTION OF THE SOCIETY.

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ARTICLE 1. The name of this society shall be the Northern Wisconsin Agricultural and Mechanical Association. Its object shall be the promotion of agricultural, mechanical and household arts.

ART. 2. *Membership.*—This association shall consist of the life members of the same and the presidents of all agricultural, mechanical, horticultural and stock growers' associations within its jurisdiction.

ART. 3. *Life Membership.*—Any person may become a life member by the payment to the secretary of the sum of \$10, receiving from him a certificate of such membership, which shall not be transferable, but which shall entitle the person to whom issued, his wife or minor children, to free admission to all the fairs and exhibitions of the society.

ART. 4. *Officers.*—The officers of the association shall be a president, eight vice-presidents, a treasurer and secretary, who shall be elected by ballot at the annual election. The officers named in this article, having been duly elected, shall at this or some other time within ten days, and at such place as the president shall designate, elect by ballot, five persons, who must be members of the association, and who shall constitute and be designated, *The Board of Control.*

ART. 5. *President.*—The president shall be *ex-officio* a member of the board of control; shall preside at all meetings of the association and of the board of control (but in case of absence or inability, one of the vice-presidents shall act as president and discharge all of the duties of that office). He shall sign all contracts or other instruments of writing which have first been approved by the board of control. He shall sign all warrants drawn on the treasurer (the account for which the same is drawn having been first approved by the board); he shall have the casting vote in all cases of a tie, and may call a special meeting whenever he may deem it necessary.

ART. 6. *Treasurer.*—The treasurer shall have charge of the funds of the associations, and pay the same out only on the order of the president, countersigned by the secretary. He shall attend all fairs of the association, receive the entrance or admission fee; keep a correct account of all receipt and disbursements, and perform such other duties as the board of control shall direct, and give bonds for the faithful performance of his duties.

ART. 7. *Secretary.*—The secretary shall do all the correspondence of the society, keep a record of its proceedings and of the board of control, and prepare the same for publication. He shall collect all moneys due the society

from any source, including receipts from grand stand (except fees for admission to fairs), and pay the same over to the treasurer, taking his receipt therefor; keep proper account books, and discharge such other duties as pertain to his office, or as the board of control shall direct. He shall also give bonds for the faithful accounting of all moneys that may come into his hands belonging to the association.

ART. 8. *Board of Control.*—The board of control shall have full power to manage the affairs of the association. They shall fill all vacancies, except that superintendents of departments may appoint judges by and with their consent, arising from absence or inability to serve; fix compensation of all officers of the association, appoint and remove at pleasure all appointed officers, agents and employes, prescribe their duties and fix their compensation; also to make rules and regulations for the guidance of the officers in the discharge of their duties; they shall classify by departments, group and class, all articles likely to be entered for exhibition; appoint the time of opening and closing the annual fair; to prescribe and publish at least by the 15th of April of each year a schedule of premiums to be awarded; to fix the price of entries and admission; to appoint appropriate committees; to superintend and to make awards in the several departments; to determine upon and fix up proper ground and place of meeting or exhibition, and to provide rules and regulations governing the same. They shall audit all bills and accounts, and cause to be kept a complete and correct record of all their proceedings, and to allow no moneys or disbursements of the funds of the society, or any improvement of the property of the same to be made without the recorded approval of a majority of the board. They shall, as soon after the annual fair as practicable, pay to the exhibitors premiums which have been awarded from surplus funds of the association over actual expense, *pro rata*, and shall within sixty days after the close of the annual fair publish a full report of their proceedings and a complete detailed statement of the condition of the affairs of the association.

ART. 9. *Annual Meeting.*—The annual meeting of the association shall be held on the second Tuesday of January in each year at such a place and hour of the day as a quorum of the board of control may direct. At such annual meetings each agricultural, mechanical, horticultural and stock growers' association within the jurisdiction of the association, shall be entitled to three delegates, who shall be allowed to cast one vote each in the election of officers and the transaction of any other business proper to be done at such meeting. Notice shall be given as required by section 4 of the act of incorporation, approved March 23, 1871, general laws.

ART. 10. This constitution may be altered or amended at any annual meeting of the association by a majority vote.



## EXECUTIVE MEETINGS.

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Executive meeting held at the Beckwith House, in the city of Oshkosh, October 2, 1876. The following members were present: President J. M. Smith, Vice-Presidents Clark, Stoddard, Loper, Huntley, Hutchinson and Lamb.

Dana C. Lamb acted as secretary *pro tem*.

Motion prevailed that the premium offered in gentlemen's driving purse shall be construed to mean single horses.

Motion prevailed to sustain the president in his action in refusing admittance to parties desiring to sell prize packages on fair grounds.

Motion prevailed to offer a purse of \$75 for running race on Thursday; \$50 to first horse and \$25 to second; three to enter, three to start. Entries received up to time of starting. Bad weather bars the race.

D. C. LAMB,

*Sec'y pro tem.*

R. D. TORREY, *Sec'y.*

---

Executive meeting held October 3, 1876. Present, Smith, Lamb, Zeilly, Clark and Loper.

Motion prevailed to place stallion race in place of 2:40.

In the absence of the regular committee to award the flag, the following were substituted: Messrs. Ed. E. Bryant, T. S. Allen, Cols. C. K. Pier, G. W. Carter, and Capt. Geo. Bauman.

Motion prevailed to print programme of Thursday in small bills.

Superintendent of garden produce authorized to offer \$10 as a sweepstake on such products.

Adjourned.

D. C. LAMB, *Sec'y pro tem.*

R. D. TORREY, *Sec'y.*

## EXECUTIVE MEETINGS.

Executive meeting held at the Beckwith House October 6, at 7 P. M. Present, Smith, Lamb, Stoddard, Zeilly, Clark and Loper.

Motion prevailed that the mayor, Mr. Haben, be invited to appoint a committee of two in each ward, and request that they use their personal efforts to induce the people of the city to turn out on Saturday and assist in saving the society from bankruptcy.

Motion prevailed to pay trotting purses and running purses in full.

D. C. LAMB, *Sec'y pro tem.*

R. D. TORREY, *Sec'y.*

Executive meeting held at fair grounds October 6th pursuant to call. Present, Smith, Lamb, Stoddard, Filch, Clark, Zeilly, Hutchinson, Huntley and Torrey.

Motion prevailed that the stallion race be this afternoon.

Motion prevailed to pay superintendents \$3 per day; assistant superintendents, with horse, \$4; without horse, \$2; night and day watch, \$2; marshals and assistants, \$4. Laborers and carpenters to be paid by S. M. Wagstaff, superintendent of labor.

Adjourned.

R. D. TORREY, *Sec'y.*

Executive meeting held at fair grounds October 7, at 10 A. M., pursuant to call. Full board present.

Motion prevailed that, in the absence of President Smith, Vice President Hutchinson act as president.

Motion prevailed to pay all indebtedness and current expenses in full, and if the balance will pay premiums by borrowing about \$500, then pay premiums in full; but if it requires more than \$500, to pay premiums *pro rata*.

Motion of the previous evening to pay purses in full, confirmed, by the secretary asking if that was the action of the previous evening, and was answered, "yes."

Adjourned.

R. D. TORREY, *Sec'y.*

Executive meeting, held at the society's office, Oshkosh, December 27, 1876, pursuant to call. Present — Smith, Hutchinson, Loper, Huntley, Zeilly, Lamb and Torrey.



On motion, the auditing committee, with the addition of H. E. Zeilly, were directed to settle with the secretary and treasurer. Committee reported as follows: We, the undersigned, your committee appointed to examine the accounts of the secretary, respectfully report that we have carefully discharged the duty, and find the same correct.

K. M. HUTCHINSON.

H. E. ZEILLY.

A. A. LOPER.

On motion, the report was adopted.

Motion prevailed to borrow \$4.25 to pay outstanding bills, on the individual guaranty of the board.

The time and place for holding the annual meeting was fixed for June 9, 1877, at 10 o'clock, at the court house in Oshkosh.

Demand of Eli Stilson for his premiums was ordered on file.

Statement of receipts and disbursements of C. Hazen, treasurer of Northern Wisconsin Agricultural Society for 1876 to December 27th, and the action of the committee thereon:

1876	DR.	
October 3, Gate Receipts.....		\$346 00
October 4, Gate Receipts.....		1,266 00
October 4, Gate Receipts for children .....		95 00
October 4, Grand Stand.....		20 00
October 5, Gate Receipts .....		1,734 00
October 6, Gate Receipts .....		253 00
October 7, Gate Receipts .....		68 00
October 7, Grand Stand.....		11 00
Insane Hospital.....		8 40
From gate keeper.....		15 25
From gate keeper.....		9 75
From R. D. Torrey, entries, races and stocks.....		621 00
From R. D. Torrey, rents .....		414 64
		<u>\$4,862 04</u>
	CR.	
By paid orders as per schedule .....	\$4,589 18	.....
By paid dinner tickets .....	118 65	.....
By paid Van Doren.....	100 00	.....
By paid Meachem .....	50 00	.....
	<u>\$4,857 83</u>	.....
Balance on hand.....	4 21	.....
		<u><u>\$4,862 04</u></u>

C. HAZEN, Treasurer.

The undersigned auditing committee have examined the above report of the treasurer and find all vouchers to compare accurately with orders drawn by the secretary, amounting to \$4,589.18; we report in favor of allowing his vouchers of 339 dinner tickets, amounting to \$118.65, but disallow as vouchers the payment to Van Doren, \$100, and Meachem, \$50; leaving a balance in treasury of \$154.21. All of which is respectfully submitted.

K. M. HUTCHINSON,

A. A. LOPER,

H. E. ZEILLY.

On motion the committee report was adopted.

Minutes of an executive meeting held at Oshkosh, May 9, 1877, pursuant to call of action, Pres. Loper. Present, Loper, Lamb, Huntley, Zeilly, Hutchinson, Stoddard, Torrey.

Moved that we proceed to elect a board of control, by ballot. Carried.

#### FIRST BALLOT.

Huntley .....	5
Hutchinson .....	2
Huntley was declared elected.	

#### SECOND BALLOT.

Hutchinson .....	2
Loper .....	3
Lamb .....	1
Torrey .....	1
No choice.	

#### THIRD BALLOT.

Loper .....	6
Hutchinson .....	1
Loper elected.	

#### FOURTH BALLOT.

Lamb .....	2
Stoddard .....	2
Hutchinson .....	1
Torrey .....	1
No choice.	

#### FIFTH BALLOT.

Torrey .....	6
Lamb .....	1
Torrey was elected.	

## SIXTH BALLOT.

Lamb .....	5
Hutchinson.....	2
Lamb was elected.	

## SEVENTH BALLOT.

Hutchinson.....	4
Stoddard .....	2
Smith .....	1
Hutchinson was elected.	

Motion prevailed that resignation of J. M. Smith be accepted, and that the board of control now proceed to elect to fill vacancy.

## FIRST BALLOT.

Loper .....	2
Stoddard .....	2
Hutchinson.....	1

## SECOND BALLOT.

Loper .....	3
Stoddard .....	1
Hutchinson .....	1

Loper being elected president, creating a vacancy in the board of control, J. Stoddard was elected.

Premium List as revised was taken up, and it was ordered that \$1,000 be appropriated for races; and \$125 to base ball, not less than five clubs to enter; \$75 for prize flag, three companies of not less than thirty-two to compete, prizes to be confined to companies that have not won a prize heretofore offered by this society. Entries free to all uniformed men and necessary help. \$800 to races. Adopted.

Secretary to apportion race money. Motion that the previous action of the secretary in paying 25 per cent. premium of 1876 on sums of over \$2, and in full for sums of less than \$2, be and is hereby approved, and he be authorized to pay all the rest in the same manner.

H. E. Zeilly, superintendent of farm implements.

F. M. Powers, marshal.

H. B. Dale, superintendent of horses.

Bill of C. C. Paige allowed .....	\$9 33
Bill of Robinson allowed.....	6 95
Bill of Kemberly, Clark & Co. allowed.....	9 00
Bill of Allen & Hicks .....	13 80
Bill of Arthur Aldrich deferred.....	
Bill of G. F. Stroud.....	4 45
Bill of Thompson & Sprague.....	5 00
Bill of Sawyer & Weston.....	103 00

## EIGHTH ANNUAL MEETING.

The eighth annual meeting was held at the court house in the city of Oshkosh, January 9, 1877.

Meeting was called to order at 11 o'clock A. M. by J. M. Smith of Green Bay, president.

On motion of Eli Stilson, a committee of three on credentials were appointed, as follows: Eli Stilson, C. Hazen, D. Huntley.

Recess.

Meeting again called to order, and committee on credentials reported the following persons duly accredited delegates from the respective societies named and entitled to seats in the meeting:

Winnebago County Agricultural Society — Fred. Badger, two votes, J. O'Brien.

Oshkosh Stock Growers' Association — K. M. Hutchinson, C. L. Rich, E. W. Viall.

Brown County Agricultural Society — J. M. Smith, three votes.

Fond du Lac County Agricultural Society — C. Hazen, D. C. Lamb, J. H. Martin.

Outgamie County Agricultural Society — L. L. Randall, three votes.

Appleton Stock Growers' Association, J. S. Buck, three votes.

Grand Chute Industrial Association — E. Spencer, three votes.

Grand Chute Horticultural Society — D. Huntley, three votes.

Omro Agricultural and Mechanical Association — E. R. Martin, three votes.

Northern Wisconsin Poultry Association — E. W. Saunders, J. O'Brien, C. B. W. Ryckman.

Ripon Agricultural and Mechanical Association — A. A. Loper, three votes.

Sheboygan County Agricultural Association — J. Stoddard, three votes.

State Wool Growers' Association — Eli Stilson, three votes.

Winnebago County Horticultural Society — E. Chase, R. J. Harney, J. O'Brien.

State Horticultural Society — Jas. Brainard, J. H. Hicks, S. Kezertee.

On motion of J. Stoddard, the report of the committee on Credentials was adopted.

The committee appointed at the last annual meeting to revise the constitution of the society reported a new constitution, which was read at length by K. M. Hutchinson, and, on motion of Eli Stilson, the same was considered *seriatim* and adopted. (See constitution, p. 11.)

On motion of D. Huntley, meeting adjourned to 1:30 P. M.

#### AFTERNOON SESSION.

Meeting called to order at 1:30 by President Smith.

Motion prevailed that the convention proceed to the election of officers for the ensuing year.

President appointed D. Huntley and A. A. Loper as tellers.

Informal ballot for president resulted as follows:

Whole number of votes cast was 43, of which

J. M. Smith received .....	24
K. M. Hutchins n received.....	13
J. Stoddard received .....	3
A. A. Loper received.....	3
Total.....	43

On motion of E. Chase the informal ballot was made formal and J. M. Smith declared unanimously elected.

Motion prevailed to proceed to a formal ballot for secretary. Ballot resulted as follows:

Whole number of votes cast.....	46
	==
R. D. Torrey received.....	45
J. H. Hicks received .....	1
Total.....	46
	==

R. D. Torrey was declared unanimously elected.

Motion prevailed to proceed to a formal ballot for treasurer, which resulted as follows:

C. Hazen received.....	34
K. M. Hutchinson received .....	3
E. W. Vial received .....	7
Blank received .....	1
Total.....	45
	==

Mr Hazen was declared unanimously elected.

The following vice presidents were elected unanimously:

K. M. Hutchinson, Oshkosh.  
 J. Stoddard, Green Bush.  
 D. Huntley, Appleton.  
 A. A. Loper, Ripon.  
 D. C. Lamb, Fond du Lac.  
 J. H. Felch, Amherst Junction.  
 H. E. Zeilley, Chilton.  
 Charles McConnell, Dartford.

On motion the meeting adjourned *sine die*.

### SECRETARY'S WARRANT ACCOUNT FOR 1877.

Date.	No.	To whom drawn and for what.	Amount.
Jan. 14	1	H. L. Bedient, merchandise for fair.....	\$2 40
Jan. 22	2	T. B. Reed, printing.....	7 00
Feb. 11	3	W. J. Morgan, diplomas.....	17 50
Feb. 11	4	A. H. Hart, premium on 'bus.....	5 00
Feb. 14	5	S. Freeman, premium, fair of 1871.....	2 00
Feb. 25	6	Daniel Roberts, premium.....	1 50
Feb. 28	7	Tho Damuth, carriage hire.....	3 00
Mch. 4	8	Morrison & Gallagher, drawing water.....	61 50
Apr. 13	9	Joseph Stringham, b'rd of Mason, judge on races..	7 00
June 16	10	M. Fleming, labor.....	2 25
June 30	11	Benedict & Shuman, premium, 1875.....	6 00
Oct. 7	12	Daniel White, watchman.....	4 00
Oct. 7	13	H. Jones, day police.....	4 00
Oct. 7	14	A. E. Stoddard, assistant superintendent.....	8 00
Oct. 7	15	Duane Stoddard, night watch.....	5 00
Oct. 7	16	L. Perrot, assistant superintendent.....	6 00
Oct. 7	17	H. M. Jones, assistant superintendent.....	4 00
Oct. 7	18	J. B. Huntley, night watch.....	10 00
Oct. 7	19	D. McAllister, assistant superintendent.....	12 00
Oct. 7	20	J. H. Felch, superintendent.....	18 00
Oct. 7	21	J. H. Felch, expense account.....	8 95
Oct. 7	22	W. Wa. staff, watchman.....	6 00
Oct. 7	23	J. B. Taylor, assistant superintendent, etc.....	19 25
Oct. 7	24	Dudley Cole, selling tickets.....	8 00
Oct. 7	25	Mr. and Mrs. Carrier, assistant superintendents...	22 00
Oct. 7	26	Dana C. Lamb, superintendent services.....	18 00
Oct. 7	27	J. Sanders, labor.....	2 00
Oct. 7	28	W. F. Goss, assistant superintendent.....	10 00
Oct. 7	29	Sarah E. Taylor, assistant superintendent.....	10 00
Oct. 7	30	A. A. Loper, superintendent.....	22 60
Oct. 7	31	H. Young, night watch.....	10 00
Oct. 7	32	P. A. Dale, assistant superintendent, horses.....	26 00
Oct. 7	33	J. Howard, day watch.....	12 00
Oct. 7	34	J. Stoddard, superintendent.....	29 75
Oct. 7	35	D. Huntley, superintendent services.....	23 00
Oct. 7	36	J. M. Smith, expense account.....	136 41



# SECRETARY'S WARRANT ACCOUNT.

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Date.	No.	To whom drawn and for what.	Amount.
Oct. 9	37	J. Harris, day watch.....	\$6 00
Oct. 9	38	D. Chapman, day watch.....	7 00
Oct. 9	39	F. M. Powers, marshal services.....	35 00
Oct. 9	40	P. Barker, day watch.....	8 00
Oct. 9	41	Thos. Dowling, day watch.....	4 00
Oct. 9	42	Fernandez & Glaze, printing.....	132 00
Oct. 9	43	K. M. Hutchi son.....	16 16
Oct. 9	44	Well diggers, digging well.....	93 00
Oct. 9	45	Ole Oleson, assistant superintendent.....	12 00
Oct. 9	46	Gib Lane, assistant superintendent.....	4 00
Oct. 9	47	P. J. Dalanty, assistant superintendent.....	10 00
Oct. 9	48	W. Kenedy, assistant superintendent.....	12 00
Oct. 9	49	K. M. Hutchinson, assistant superintendent.....	18 00
Oct. 9	50	H. Page, police.....	6 00
Oct. 9	51	Thos. Dowling, labor.....	10 00
Oct. 9	52	Mrs. Dorsey, labor.....	10 50
Oct. 9	53	W. B. Newcomb, labor, carpenter.....	8 25
Oct. 9	54	A. Hilton, watch.....	6 00
Oct. 9	55	C. N. Paine & Co., lumber, etc. (1875 and 1876).....	294 71
Oct. 9	56	J. O'Brien, superintendent.....	18 00
Oct. 9	57	J. S. Tufts, purse on trotting.....	175 00
Oct. 9	58	B. H. Soper, use of show cases.....	5 00
Oct. 9	59	A. Rickey, ass't sup't.....	13 00
Oct. 9	60	Geo. Prine, sawdust and teaming.....	25 00
Oct. 9	61	P. Gardner, labor.....	2 65
Oct. 9	62	M. Connors, labor.....	8 75
Oct. 9	63	R. E. Daniel, band.....	140 00
Oct. 9	64	I. Soper, use of pumps.....	18 00
Oct. 9	65	N. H. Green, drayage.....	5 75
Oct. 9	66	Wm. Bell, labor.....	8 43
Oct. 9	67	W. H. Ballou, use of crockery.....	15 95
Oct. 9	68	A. B. Smith, ass't marshal.....	30 00
Oct. 9	69	Wm. R. Adams, night watch.....	10 00
Oct. 9	70	Fred Badger, clerk hire.....	59 00
Oct. 9	71	J. Lucy, special police.....	8 00
Oct. 9	72	A. H. Howard, special police.....	8 00
Oct. 9	73	Allen & Hicks, printing.....	207 83
Oct. 9	74	N. Conrad, clerk hire.....	22 50
Oct. 9	75	Frank Cross, clerk.....	19 50
Oct. 9	76	W. Clough, day watch.....	5 00
Oct. 9	77	M. P. Griswoal, premium 1875.....	15 00
Oct. 9	78	Wm. Hall, purse on racing.....	50 00
Oct. 9	79	J. W. Flack, premium trot.....	90 00
Oct. 9	80	C. B. Bartlett, trotting premium.....	60 00
Oct. 9	81	S. J. Wilson, trotting premium.....	165 00
Oct. 9	82	N. O. Needham, trotting promium.....	100 00
Oct. 9	83	A. B. Medbury, trotting premium.....	250 00
Oct. 9	84	W. A. West, sawdust.....	.....
Oct. 9	85	W. R. Kendall, trotting premium.....	100 00
Oct. 9	86	E. R. Hammond, trotting premium.....	100 00
Oct. 9	87	G. H. Brickner, trotting premium.....	25 00
Oct. 9	88	S. S. Lasher, trotting premium.....	35 00
Oct. 9	89	C. E. Lewis, police.....	6 00
Oct. 9	90	Stanley, McKeon & Co., drayage, etc.....	9 20
Oct. 10	91	J. E. Sanders, labor.....	8 75
Oct. 10	92	R. Hudson, night watch.....	10 00
Oct. 10	93	G. Williams, day watch.....	6 00
Oct. 10	94	Saurau & Weidner, printing.....	32 25
Oct. 10	95	C. Curtis, ticket seller, 1875.....	3 00
Oct. 10	96	Ed. Danforth, selling tickets.....	10 50
Oct. 10	97	M. Harris, lumber, etc.....	203 89
Oct. 10	98	Eli Stilson, night watch.....	5 00

## SECRETARY'S WARRANT ACCOUNT.

Date.	No.	To whom drawn and for what.	Amount.
Oct. 10	99	H. B. Dale, assistant marshal.....	\$30 00
Oct. 10	100	H. A. Amaraux, carpenter work.....	3 40
Oct. 10	101	F. McCarthy, work.....	6 71
Oct. 10	102	Gus. Th. m, night police.....	10 00
Oct. 10	103	C. Hazen, services.....	18 00
Oct. 10	104	E. W. Viall, 8 days' service.....	24 00
Oct. 10	105	J. C. Davis, assistant superintendent.....	20 00
Oct. 10	106	J. Blake.....	20 00
Oct. 10	107	Sam. Wagstaff.....	48 00
Oct. 10	108	W. W. Lake, carpenter work.....	4 12
Oct. 10	109	H. Adams, day police.....	8 00
Oct. 11	110	R. M. Donaldson, carpenter work.....	12 37
Oct. 11	111	Vans. S. Potter, carpenter work.....	16 87
Oct. 11	112	M. Fleming, labor.....	17 25
Oct. 12	113	F. Zeutner, gate service.....	26 00
Oct. 12	114	F. Zeutner, Jr. do.....	16 00
Oct. 12	115	Charles Griffin, do.....	16 00
Oct. 12	116	P. Zeutner.....do.....	20 00
Oct. 12	117	H. Bowker, straw.....	42 00
Oct. 12	118	George Lambert, ass't sup't.....	11 00
Oct. 12	119	John Zeutner, police.....	6 00
Oct. 12	120	Harry Clark, ass't sup't.....	19 25
Oct. 12	121	S. t. Clark, sup't.....	18 00
Oct. 12	122	R. D. Torrey, salary.....	500 00
Oct. 12	123	J. H. Jones, bal. due from last year....	17 35
Oct. 12	124	O. H. Evans, night watch.....	8 00
Oct. 12	125	O. H. Evans, labor.....	3 43
Oct. 12	126	C. B. W. Ryckman, ass't sup't poultry.....	4 00
Oct. 12	127	M. Jameson, carpenter work.....	10 12
Oct. 12	128	C. P. Houghton, money refunded.....	3 40
Oct. 12	129	Mrs. R. H. Rollins, attendance on ladies room, etc..	18 00
Oct. 12	130	E. Quinn, labor.....	4 50
Oct. 12	131	S. M. Hay & Co., hardware.....	7 25
Oct. 12	132	W. C. Wheeler, stensil.....	1 00
Oct. 12	133	D. Heberlee, drayage.....	1 00
Oct. 13	133½	M. Carrigan, carriage hire.....	7 00
Oct. 13	134	Siewert, carriage hire.....	5 00
Oct. 16	135	Coe & Fobes, hack hire.....	9 00
Oct. 16	136	Henry Sarau, bill posting.....	5 00
Oct. 16	137	M. Fleming, watching.....	2 00
Oct. 17	138	E. W. Viall, merchandise.....	7 00
Oct. 17	139	George H. Daubner, money refunded.....	2 20
Oct. 17	140	George Revland, labor.....	1 75
Oct. 17	141	W. W. Lake, selling tickets.....	10 50
Oct. 17	142	E. Stilson, hay.....	170 00
Oct. 17	143	C. Hazen, service as treasurer.....	19 50
Oct. 17	144	T. C. Little, hay and straw.....	97 68
Nov. 11	145	A. Hubbard, gate service.....	12 00
Dec. 28	146	Erwin Heath, p. stage.....	64 36
Dec. 28	147	R. D. Torrey, disbursement.....	76 09
1877.			
Apr. 20	148	C. Hazen, dinner tickets.....	175 60
Apr. 20	149	E. R. Martin, service.....	12 00
Apr. 20	150	Bigger & Clark, goods.....	29 30
Apr. 20	151	G. R. Lampard, balance of premium of 1876.....	2 00
Apr. 21	152	E. Stilson, 25 per cent. of premium of 1876....	92 25
Apr. 21	153	James Br. inard.....do.....	5 75
Apr. 21	154	Mrs. A. Brown.....do.....do.....	3 28
Apr. 24	155	C. Hazen.....do.....do.....	20 50
Apr. 24	156	J. D. Van Doren.....do.....	48 50
Apr. 24	157	G. F. Stroud, glass, etc.....	4 45
Apr. 24	158	Fern Pratt, 25 per cent. of premium of 1876.....	1 25



Date.	No.	To whom drawn and for what.	Amount.
Apr. 24	159	Allen & Hicks, printing.....	\$13 80
Apr. 24	160	C. W. Radford, 25 per cent. of premium of 1876....	50
Apr. 25	161	Wm. Wakeman...do.....do.....	75
Apr. 25	162	E. Hall, money refunded .....	3 00
Apr. 25	163	Jennie Voorhees, premium.....	1 00
Apr. 26	164	Sawyer & Weston, reporting.....	103 20
Apr. 26	165	G. Lambert, premium .....	1 00
Apr. 26	166	Mary Osthus, 25 per cent. of premium....	1 25
Apr. 27	167	J. R. Paddleford..... do.....	8 25
Apr. 27	168	Error, not drawn.	
Apr. 27	169	J. O'Brien, 25 per cent. premium of 1876.....	9 12
Apr. 27	170	C. B. W. Buckham 25 per cent., premium of 1876.	1 62
Apr. 28	171	Peter Cameron, premium .....	1 00
Apr. 28	172	Brainard Bros., 25 per cent., premium of 1876.....	3 25
Apr. 28	173	M. B. Green, 25 per cent., premium of 1876 .....	8 50
Apr. 28	174	E. W. Sanders, 25 per cent., premium of 1876.....	6 38
Apr. 28	175	Thos. Davis, 25 per cent., premium of 1876.....	11 50
May 1	176	J. Scribner, 25 per cent., premium of 1876 .....	23 50
May 1	177	C. M. Clark, 25 per cent., premium of 1876.....	4 25
May 1	178	J. Stoddard 25 per cent., premium of 1876.....	30 00
May 1	179	S. D. Paddleford, premium in part .....	2 00
May 1	180	Mrs. Awesta, premium in part .....	75
May 1	181	Flora Houghton, premium in full .....	1 00
May 1	182	Mrs. G. Houghton, premium in full.....	....
May 1	183	Mrs. Sturkweather, premium.....	1 00
May 2	184	J. Mies, premium, 25 per cent.....	6 01
May 2	185	G. B. Reese, premium, 25 per cent.....	1 62
May 2	186	Julia Halpin, premium, 1876 ..	1 00
May 3	187	S. A. Steele, money refunded.....	5 00
May 3	188	A. B. Wade, premium, fair of 1876.....	8 25
May 3	189	Mrs. E. S. Clapp, premium .....	2 50
May 4	190	Benj. Edwards, premium, 25 per cent .....	1 50
May 4	191	A. Bert Hooper, premium, 25 per cent .....	50
May 5	192	Sadie Goe, premium.....	2 00
May 5	193	K. M. Hutchinson, premium .....	2 12
May 7	194	H. A. Smith, premium ..	2 00
May 7	195	Rudd & Holden, premium .....	3 50
May 7	196	Mrs. W. F. Webster, premium .....	50
May 8	197	Mrs. A. E. Coffin 25 per cent. on premium..	1 38
May 8	198	Mrs. J. B. Swift, 25 per cent on premium.....	75
May 8	199	Mrs. L. F. Thompson, balance of premium .....	1 00
May 8	200	Mrs. Loomberger, premium .....	1 00
May 9	201	Emma Jones, premium.....	2 00
May 9	202	D. Huntley, 25 per cent on premium .....	9 50
May 9	203	J. B. Hunter, 25 per cent on premium of 1876.....	7 62
May 9	204	A. H. Hart, 25 per cent. on premium.....	6 00
May 9	205	H. B. Jackson, 25 per cent. on premium of 1876....	2 00
May 10	206	R. S. Rick, 25 per cent. on premium.....	4 50
May 10	207	R. Kenedy, premium....	1 00
May 11	208	Thompson & Spague, livery.....	5 00
May 11	209	T. Lawrence, premium, 1876.....	2 00
May 11	210	N. G. Stoddard, premium .....	4 75
May 11	211	R. McMillen & Co., lumber.....	7 94
May 11	212	B. F. Moore premium, 25 per cent., 1876.....	75
May 12	213	James Bowe, premium, 25 per cent.....	3 00
May 12	214	W. W. Lake, premium, 25 per cent., 1876.....	1 00
May 12	215	Millie Rich, premium.....	1 00
May 12	216	C. Ely, premium.....	1 00
May 12	217	C. Strever, premium.....	1 50
May 14	217½	H. A. Montgomery, premium in full.....	1 00
May 14	218	L. Woodworth, premium.....	1 00
May 14	219	W. E. Montgomery, premium, 1876 .....	1 00

Date.	No.	To whom drawn and for what.	Amount.
May 14	220	Gertie Torney, premium, 1876 .....	\$0 50
May 15	221	C. C. Paige, merchandise.....	9 33
May 15	222	Mary McKoy, premium.. ..	1 00
May 15	223	Claggett & Co., premium.....	1 00
May 15	224	Jas. Lewis, premium, 25 per cent .....	6 75
May 15	225	Emma Goodland, premium.....	1 00
May 18	226	Mrs. C. H. Root, premium 20 per cent.....	\$10 38
May 18	227	Geo. H. Daubner, premium 20 per cent.....	15 50
May 18	228	A. C. Austin, premium.....	4 00
May 18	229	Kimberly, Clark & Co., paper .....	9 00
May 19	230	E. R. Martin, premium 1876 .....	5 25
May 21	231	Mary Prock, premium .....	1 00
May 21	232	W. C. Hubbard, premium 25 per cent.....	1 50
May 22	233	William Servis, premium 25 per cent.....	3 00
May 22	234	C. F. Rogers, premium.....	2 25
May 22	235	Jas. Lewis, premium.....	4 75
May 23	236	Susie Johnson, premium.....	1 00
May 23	237	Mrs. C. Johnson, premium.....	50
May 25	238	C. Chase, premium 1876.....	5 00
May 25	239	Spink and Horton, premium .....	1 25
May 25	239½	C. Brasted, premium .....	25 00
May 26	240	Mrs. A. T. Glaze, premium .....	4 00
May 26	241	Mrs. E. D. Kent, premium 1876 .. ..	4 50
May 26	242	Nellie Kent, premium.....	50
May 29	243	B. H. Soper, premium 1875-76.....	13 00
May 30	244	T. J. Barton, premium 25 per cent .....	4 00
June 2	245	William Hall, balance of premium 1876.....	2 00
June 2	246	Z. D. Lewis, premium .....	2 25
June 2	247	Miss A. Collins, premium.....	1 00
June 2	248	Miss N. Harris, premium .....	50
June 7	249	J. W. McKeen, premium 1876 .....	5 12
June 7	250	J. M. Smith, premium .....	4 25
June 7	251	Emily T. Smith, premium.....	3 63
June 9	252	Chas. Ross, premium .....	2 75
June 9	252	W. S. Bradford, premium 25 per cent .....	2 50
June 9	254	Mrs. Gib. Lane, premium .....	2 54
June 13	255	Wm. and Mrs Burtis, premium 1876.....	4 00
June 23	256	W. W. Woodward, premium.. ..	9 50
June 23	257	Kate Peffer, premium 25 per cent.....	4 00
June 23	258	Alice Collins, premium .....	50
June 27	259	C. R. Gibbs, premium 25 per cent .....	5 00
July 3	260	L. M. Taylor, premium 25 per cent.....	1 50
July 3	261	John Goodland, services.....	15 00
July 3	262	H. Billings, services.....	10 00
July 7	263	Parish and Briggs, premium.....	5 00
July 10	264	Mrs. Wm. Sill, premium 1875.....	8 00
July 10	265	R. D. Torrey, disbursements .....	10 64
July 13	266	Mrs. Thrall, premium 1876 .....	2 00
July 16	267	Geo. J. Kellogg, premium.....	5 62
July 16	268	Geo. J. Kellogg, services superintendent .....	8 00
July 16	269	J. O'Zaune, premium 25 per cent., 1876.....	1 25
July 16	270	Irwin Heath, postage.....	31 00
July 16	271	M. A. Olcott, premium.....	1 50
July 18	272	M. E. Asire, premium .....	1 00
July 20	273	Geo. M. Hasbrouck, sign.....	4 50

# LIST OF PREMIUMS

AWARDED AT THE SEVENTH ANNUAL FAIR.

## DIVISION A.

### CLASS 1. — THOROUGHBRED HORSES.

Best stallion 4 years and over, H. Curran .....	\$15 00
Best brood mare 4 years and over, foal by side, Wm. Hall.....	12 00
Best gelding 3 years, Mrs. Hall, discretionary.....	.....

### CLASS 2. — ROADSTERS AND CARRIAGE HORSES.

Best stallion 4 years and over, Parish & Briggs .....	\$15 00
2d best stallion 4 years and over, T. Lawrence.....	8 00
Best stallion 2 years and under 3, John Gardinier. ....	10 00
2d best, 2 years and under 3, Jno. H. Lyon.....	5 00
Best stallion, 1 year and under 2, H. S. Sabin .....	8 00
2d best, Miss C. R. Gibbs .....	4 00
Best sucking stallion foal, G. R. Lampard.....	6 00
Best brood mare, 4 years and over, this year's colt by side, Miss C. R. Gibbs .....	12 00
2d best, G. R. Lampard.....	6 00
Best mare or gelding, 7 years and over, Mrs. L. F. Thompson.....	10 00
2d best, H. B. Dale.....	5 00
2d best mare or gelding, 3 years and under 4, J. R. Padelford.....	4 00
Best mare or gelding, 2 years and under 3, Benj. Edwards.....	6 00
2d best, J. R. Padelford.....	3 00
Best mare or gelding, 1 year and under 2, T. J. Barton .....	4 00
2d best, John Athern.....	2 00
Best sucking filly foal, Miss C. R. Gibbs.....	4 00
2d best, H. A. Smith.....	2 00
Best pair matched horses, 5 year and over, B. T. Phillips.....	12 00
2d best, E. S. Kircher.....	6 00

### CLASS 3. HORSES GENERAL PURPOSES.

Best stallion, 4 years and over, Isaac Anthony.....	\$15 00
2d best, H. A. Babcock .....	8 00
Best stallion, 3 years and under 4, James Bowe .....	12 00
2d best, C. W. Green.....	6 00
Best stallion, 2 years and under 3, W. S. Bradford.....	10 00
Best stallion, 1 year and under 2, A. B. Wade.....	8 00
Best sucking stallion foal, S. D. Padelford.....	6 00
2d best, J. D. Van Doren.....	3 00
Best brood mare, this year's colt by side, J. D. Van Doren.....	12 00
2d best, S. D. Padelford .....	6 00
Best mare or gelding, 4 years and over, A. Pardie .....	10 00
2d best, A. B. Wade .....	5 00
Best mare or gelding, 3 years and under 7, John Freeborn.....	8 00
Best mare or gelding, 2 years and under 3, J. D. Van Doren.....	6 00

## PREMIUMS AWARDED.

Best sucking filly foal, J. D. Van Doren.....	\$4 00
2d best, J. W. Cross .....	2 00
Best pair matched horses, mares or geldings, 5 years and over, J. R. Thompson.....	12 00
2d best, Frank Schonrer.....	6 00
Best pair matched horses, mares or geldings, under 5 years, J. W. Dake, .....	10 00
2d best, W. S. Catlin.....	5 00
Best mare or gelding, 2 years, S. M. Wagstaff .....	0 00
2d best, S. M. Wagstaff.....	0 00

## CLASS 4 — DRAFT HORSES.

Best stallion, 4 years and over, J. R. Padelford .....	\$15 00
2d best, 4 years and over, J. D. Van Doren .....	8 00
Best, 3 years and under 4, J. D. Van Doren .....	12 00
Best, 2 years and under 3, J. D. Van Doren .....	10 00
2d best, 2 years and under 3, J. D. Van Doren.....	5 00
Best, 1 year and under 2, J. D. Van Doren.....	8 00
2d best, 1 year and under 2, J. R. Padelford.....	4 00
Best sucking stallion foal, J. D. Van Doren.....	6 00
2d best, John Athearn.....	3 00
Best mare, this year's colt by side, J. D. Van Doren .....	12 00
2d best, J. D. Lewis.....	6 00
Best mare or gelding, 4 years and over, Thomas Davis .....	12 00
2d best, J. D. Van Doren .....	6 00
Best mare or gelding, 3 years and over, J. D. Van Doren .....	8 00
2d best, Sam. Wagstaff .....	4 00
Best mare or gelding, 2 years and over, J. D. Van Doren .....	6 00
Best sucking filly foal, W. C. Hubbard .....	6 00
2d best, J. D. Lewis .....	3 00
Best stallion, 5 of his get under 2, J. D. Van Doren .....	12 00
2d best, J. R. Padelford .....	7 00

## DIVISION B.

## CLASS 6 — SHORTHORN THOROUGHBREDS.

Best bull, 4 years and over, Eli Stilson.....	\$16 00
Best bull, 3 years and under 4, Eli Stilson .....	16 00
Best bull, 2 years and under 3, Eli Stilson .....	16 00
2d best, Eli Stilson .....	8 00
Best bull, 1 year and under 2, J. C. Mitchem .....	16 00
Best bull calf, 6 months, Eli Stilson .....	10 00
2d best, J. C. Mitchem .....	5 00
Best cow, 4 years and over, Eli Stilson .....	16 00
2d best, J. C. Mitchem .....	8 00
Best cow, 3 years and under 4, J. C. Mitchem .....	16 00
2d best, Eli Stilson .....	8 00
Best heifer, 2 years, Eli Stilson .....	16 00
2d best, Eli Stilson .....	8 00
Best heifer, 1 year, Eli Stilson .....	16 00
2d best, Eli Stilson .....	8 00
Best heifer calf, over 6 months, Eli Stilson .....	10 00
2d best, J. C. Mitchem .....	5 00
Best heifer calf, under 6 months, J. C. Mitchem.. ..	10 00
2d best, J. C. Mitchem.....	5 00
Best bull, any age, Eli Stilson .....	Diploma.

## CLASS 7. — Ayrshire THOROUGHBREDS.

Best bull, 4 years and over, Chester Hazen.....	\$16 00
Best bull, 3 years and over, J. Stoddard.....	16 00

Best bull, 2 years and over, J. Scribner.....	\$16 00
2d best, J. Stoddard.....	8 00
Best bull, 1 year and over, J. Stoddard.....	16 00
2d best, D. Huntley.....	8 00
Best bull calf, 6 months, D. Huntley.....	10 00
2d best, J. Stoddard.....	5 00
Best bull calf, under 6 months, D. Huntley.....	10 00
2d best, J. Stoddard.....	5 00
Best cow, 4 years and over, J. Scribner.....	16 00
2d best, J. Stoddard.....	8 00
Best cow or heifer, 3 years, J. Stoddard.....	16 00
2d best, J. Scribner.....	8 00
Best heifer, 2 years, Chester Hazen.....	16 00
2d best, J. Scribner.....	8 00
Best heifer, 1 year, J. Stoddard.....	16 00
2d best, Chester Hazen.....	8 00
Best heifer calf, 6 months, D. Huntley.....	10 00
2d best, J. Scribner.....	5 00
Best heifer calf, under 6 months, Chester Hazen.....	10 00
2d best, J. Scribner.....	5 00
Best bull, any age, J. Scribner.....	Dip.
Best cow, any age, J. Scribner.....	Dip.

CLASS 8.—DEVON THOROUGHBREDS.

Best bull, 3 years and over, Luther Rawson.....	\$10 00
2d best, Thomas Davis.....	5 00
Best bull, 2 years and over, James H. Thomas.....	10 00
Best bull 1 year and over, Luther Rawson.....	8 00
2d best, Luther Rawson.....	4 00
Best bull calf, Luther Rawson.....	5 00
Best cow or heifer, 3 years, Luther Rawson.....	10 00
2d best, Luther Rawson.....	3 00
Best heifer, 2 years, Luther Rawson.....	10 00
2d best, Luther Rawson.....	5 00
Best heifer, 1 year, Luther Rawson.....	8 00
2d best, Thomas Davis.....	4 00
Best heifer calf, Luther Rawson.....	5 00
2d best, Luther Rawson.....	3 00
Best bull, any age, Luther Rawson.....	Dip.
Best cow, any age, Luther Rawson.....	Dip.

CLASS 9.—JERSEYS OR ALDERNEYS, THOROUGHBREDS.

Best bull, 2 years, N. G. Sturtevant.....	8 00
2d best, H. B. Jackson.....	4 00
Best bull calf, J. W. Hoglin.....	4 00
2d best, N. G. Sturtevant.....	2 00
Best cow or heifer, 3 years and over, H. B. Jackson.....	8 00
2d best, A. C. Austin.....	4 00
Best heifer, 2 years, George Badger.....	8 00
Best heifer, 1 year, A. C. Austin.....	6 00
Best heifer calf, A. C. Austin.....	4 00
Best bull, 4 years and over, L. F. Beebe.....	Discretionary

CLASS 10.—GALLOWAY.

Best bull, 1 year, A. B. Wade.....	8 00
Best heifer, 2 years, A. B. Wade.....	8 00

CLASS 11.—GRADE AND NATIVE.

Best cow, 4 years, E. L. Paine.....	8 00
2d best, M. B. Green.....	4 00



## PREMIUMS AWARDED.

Best cow or heifer, 3 years, Eli Stilson .....	\$8 00
2d best, Eli Stilson .....	4 00
Best heifer, 2 years, M. B. Green .....	8 00
2d best, Eli Stilson .....	4 00
Best heifer, 1 year, Eli Stilson .....	6 00
2d best, N. G. Sturtevant .....	3 00
Best heifer calf, Eli Stilson .....	4 00
2d best, J. H. Sturtevant .....	2 00
Best pair working oxen, 4 years and over, Luther Rawson .....	8 00
Best pair steers, 2 years, N. G. Sturtevant .....	6 00
2d best, Thos. Davis .....	3 00
Best cow or heifer, any age, Eli Stilson .....	Dip.

## CLASS 12.—SWEEPSTAKES AND HERD PREMIUMS.

Best bull, over 1 year, Eli Stilson .....	\$20 00
Best cow or heifer, over 1 year, Eli Stilson .....	20 00
Best bull calf, Eli Stilson .....	12 00
Best heifer calf, Eli Stilson .....	12 00
Best bull and 4 cows or heifers, over 2 years, Eli Stilson .....	50 00
2d best, J. C. Mitchem .....	35 00
3d best, Luther Rawson .....	20 00
Best bull and 4 heifers, under 2 years, Eli Stilson .....	35 00
2d best, J. C. Mitchem .....	20 00
Best bull and 4 cows or heifers, over 1 year, Ay. or Jer., J. Scribner .....	35 00
2d best, J. Stoddard .....	30 00
3d best, Chester Hazen .....	20 00

## DIVISION C.—SHEEP.

## CLASS 13.—AMERICAN MERINO.

Best ram, 2 years and over, R. S. Rich .....	6 00
2d best, R. S. Rich .....	4 00
Best ram, 1 year and over, C. M. Clark .....	6 00
2d best, R. S. Rich .....	4 00
Best pen 3 ram lambs, Jas. Worthing .....	6 00
Best pen 3 ewes, 2 years, Jas. Worthing .....	6 00
2d best, R. S. Rich .....	4 00
Best pen 3 ewes, 1 year, C. M. Clark .....	6 00
2d best, C. M. Clark .....	3 00
Best ram, any age, C. M. Clark .....	Dip.
Best ewe, any age, C. M. Clark .....	Dip.
2d best 10 ewes and 1 ram, full blood, Eli Stilson .....	5 00

## CLASS 14.—SOUTHDOWNS AND OTHER MIDDLE WOOLS.

Best ram, 2 years and over, Geo. H. Daubner .....	\$5 00
2d best, Luther Rawson .....	3 00
Best ram, 1 year, Luther Rawson .....	5 00
2d best, Geo. H. Daubner .....	3 00
Best pen three ram lambs, Geo. H. Daubner .....	4 00
2d best, Luther Rawson .....	2 00
Best pen three ewes, 2 years, Luther Rawson .....	5 00
2d best, Geo. H. Daubner .....	3 00
Best pen three ewes, 1 year, Geo. H. Daubner .....	5 00
2d best, Luther Rawson .....	3 00
Best pen three ewe lambs, Geo. H. Daubner .....	4 00
2d best, Luther Rawson .....	2 00
Best ram, any age, George H. Daubner .....	Diploma.
Best ewe, any age, George H. Daubner .....	Diploma.
Best pen ten ewes and one ram, Geo. H. Daubner .....	\$10 00

CLASS 15. — GRADES FROM FINE WOOL BUCKS.

Best ram, 2 years and over, E. R. Martin.....	\$3 00
Best pen three ram lambs, E. R. Martin.....	3 00
Best pen three ewes, 2 years, E. R. Martin.....	3 00
Best pen three ewe lambs, E. R. Martin.....	3 00

CLASS 16. — COTSWOLD.

Best ram, 1 year, Geo. Harding.....	\$6 00
Best pen three ram lambs, Geo. Harding.....	6 00
2d best, Geo. Harding.....	4 00
Best pen three ewes, 2 years, Geo. Harding.....	6 00
2d best, Geo. Harding.....	4 00
Best pen three ewes, 1 year, Geo. Harding.....	6 00
2d best, Geo. Harding.....	3 00
Best pen three ewe lambs, Geo. Harding.....	6 00
2d best, Geo. H. Daubner.....	3 00
Best ten ewes and one ram, full blood, Geo. Harding.....	10 00

CLASS 17. — LEICESTER.

Best ram, 2 years and over, J. O'Brien.....	\$6 00
2d best, Geo. H. Daubner.....	4 00
Best ram, 1 year and over, Geo. H. Daubner.....	6 00
2d best, Mr. Towers.....	4 00
Best pen three ewes, 2 years, Geo. Harding.....	6 00
2d best, Geo. Harding.....	4 00
Best pen three ewes, 1 year, Geo. H. Daubner.....	6 00
2d best, Geo. H. Daubner.....	3 00
Best pen three ewe lambs, Geo. H. Daubner.....	6 00
2d best, J. O'Brien.....	3 00
Best ram, any age, Geo. H. Daubner.....	Dip.
Best ewe, any age, Geo. H. Daubner.....	Dip.
Best ten ewes and one ram, full blood, Geo. H. Daubner.....	\$10 00
Best pen three ram lambs, John O'Brien.....	0 00
2d best, John O'Brien.....	0 00

CLASS 18. — GRADES FROM LONG WOOL BUCKS.

Best pen three ewes, 1 year, Eli Stilson.....	\$3 00
Best pen three ewe lambs, Eli Stilson.....	3 00

CLASS 19. — SWINE — BERKSHIRE.

Best boar, 2 years and over, Eli Stilson.....	\$7 00
2d best, M. Towers.....	4 00
Best boar, 1 year, J. C. Mitchem.....	6 00
2d best, Eli Stilson.....	3 00
Best boar pig, over 6 months, Eli Stilson.....	4 00
Best boar pig, under 6 months, Jas. Worthing.....	4 00
2d best, J. C. Mitchem.....	2 00
Best breeding sow, 2 years, J. C. Mitchem.....	7 00
2d best, Eli Stilson.....	4 00
Best breeding sow, 1 year, Eli Stilson.....	6 00
2d best, J. C. Mitchem.....	3 00
Best sow pig, over 6 months, Eli Stilson.....	4 00
2d best, Eli Stilson.....	2 00
Best sow pig, under 6 months, J. C. Mitchem ..	4 00
2d best, Jas. Worthing.....	2 00
Best breeding sow with litter pigs less than 4 months, J. O'Brien.....	8 00
2d best, Eli Stilson .....	4 00
Best boar any age, J. C. Mitchem.....	Dip.

## PREMIUMS AWARDED.

## CLASS 20.—SWINE—POLAND CHINA, CHESTER WHITE, ETC.

Best boar, 2 years and over, W. W. Woodward.....	\$7 00
Best boar, 1 year and over, M. B. Green.....	6 00
2d best, E. R. Martin.....	3 00
Best boar pig, over 6 months, W. W. Woodward.....	4 00
2d best, W. W. Woodward.....	2 00
Best boar pig, under 6 months, C. Hazen.....	4 00
2d best, W. W. Woodward.....	2 00
Best breeding sow, 2 years, W. W. Woodward.....	7 00
Best breeding sow, 1 year, E. R. Martin.....	6 00
Best sow pig, over 6 months, W. W. Woodward.....	4 00
2d best, W. W. Woodward.....	2 00
Best sow pig under 6 months, W. W. Woodward.....	4 00
2d best, W. W. Woodward.....	2 00
Best breeding sow, with litter of pigs, not less than four, C. Hazen.....	8 00
2d best, W. W. Woodward.....	4 00
Best sow with litter of pigs, 11 months, M. B. Green.....	....

## CLASS 21 — SWINE, ESSEX, SUFFOLK AND OTHER SMALLER BREEDS.

Best boar, 2 years and over, J. D. Van Doren.....	7 00
2d best, J. D. Van Doren.....	3 00
Best Boar 1 year old or over, J. D. Van Doren.....	6 00
2d best, J. D. Van Doren.....	3 00
Best boar pig over six months, J. D. Van Doren.....	4 00
Best boar pig under six months, J. D. Van Doren.....	4 00
Best breeding, over 2 years, J. D. Van Doren.....	7 00
2d best, Thos. Davis.....	4 00
Best breeding sow, 1 year old, J. D. Van Doren.....	6 00
2d best, J. D. Van Doren.....	3 00
Best sow pig over six months old, J. D. Van Doren.....	4 00
2d best, Thos. Davis.....	2 00
Best sow pig under six months old, Thos. Davis.....	4 00
2d best, Thos. Davis.....	2 00
Best breeding sow, with litter of pigs, not less than four, J. D. Van Doren.....	8 00
2d best, J. D. Van Doren.....	8 00

## CLASS 22 — POULTRY.

## ASIATIC CLASS.

Best trio black Javas, A. Richardson.....	2 50
2d best, A. Richardson.....	1 50
Best trio light Brahmas, A. Richardson.....	2 50
2d best, A. Richardson.....	1 50
Best trio dark Brahmas, A. B. Wade.....	2 50
2d best, A. B. Wade.....	1 50
Best trio buff Cochins, J. McKeen.....	2 50
2d best, J. McKeen.....	1 50
Best trio part idge Cochins, C. B. W. Ryckman.....	2 50
2d best, J. B. Huntley.....	1 50
Best trio black Cochins, G. R. Lampart.....	....
2d best, G. R. Lampart.....	....

## GAME CLASS.

Best trio brown red, Harvey Dale.....	2 50
Best trio B. B. red game, J. W. Cross & Bros.....	2 50
2d best, J. W. Cross & Bros.....	1 50
Best trio game any other variety, J. W. Cross & Bros.....	2 50
2d best, J. W. Cross & Bros.....	1 50



# PREMIUMS AWARDED.

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## DORKING CLASS.

Best trio Plymouth Rocks, Jas. McKeen .....	\$2 50
2d best, Jas. McKeen .....	1 50
Best trio Dominiques, E. W. Sanders .....	2 50
2d best, E. W. Sanders .....	1 50

## SPANISH CLASS.

Best trio Black Spanish (white face), J. McKeen .....	\$2 50
2d best trio Black Spanish .....	1 50
Best trio White Leghorns, J. B. Huntley .....	2 50
2d best, J. B. Huntley .....	1 50
Best trio Brown Leghorns, E. W. Sanders .....	2 50
2d best, C. N. Jones .....	1 50
Best Dominiques Leghorns, C. B. W. Ryckman .....	

## HAMBURG CLASS.

Best trio Black Hamburgs, E. W. Sanders .....	\$2 50
2d best, E. W. Sanders .....	1 50
Best trio S. S. Hamburgs, E. W. Sanders .....	2 50
2d best, E. W. Sanders .....	1 50
Best trio G. S. Hamburgs, C. W. Jones .....	2 50
2d best, E. W. Sanders .....	1 50

## FRENCH CLASS.

Best trio Houdans, J. N. Hoglin. ....	\$2 50
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## POLISH CLASS.

Best trio Black Polish (white crests), J. McKeen .....	\$2 50
2d best, C. W. Jones .....	1 50
Best trio Silver Polish, C. B. W. Ryckman .....	2 50
2d best, C. B. W. Ryckman .....	1 50
Best trio White Polish, C. W. Jones .....	2 50
2d best, C. W. Jones .....	1 50

## BANTAM CLASS.

Best trio B. B. Red game, John O'Brien .....	2 50
2d best, W. R. Thomas .....	1 50

## TURKEYS.

Best pair bronze turkeys, J. McKeen .....	\$2 80
2d best, J. McKeen .....	1 50
Best pair white turkeys, Jas. McKeen .....	2 50
2d best, J. D. Van Doren .....	1 50
Best pair black turkeys, J. D. Van Doren .....	2 50

## WATER FOWLS.

Best pair Breman geese, J. O'Brien .....	\$2 50
2d best, J. O'Brien .....	1 50
Best pair African geese, J. O'Brien .....	2 50
2d best, J. O'Brien .....	1 50
Best pair Aylesbury ducks, J. O'Brien .....	2 50
2d best, E. W. Sanders .....	1 50
Best pair Rouen ducks, J. McKeen .....	2 50
2d best, J. O'Brien .....	1 50
Best pair black Cayuga ducks, J. O'Brien .....	2 50
2d best, J. S. Ottman .....	1 50
Best pair white crested ducks, J. O'Brien .....	2 50
Second best, C. W. Jones .....	1 50

## ORNAMENTAL CLASS.

Best exhibition of canary birds, Mrs. Ann Brown.....	\$2 00
Best duck wing, W. R. Thomas.....	Rec.
Best trio Seabrights, W. R. Thomas.....	Rec.
2d best, Golden Seabrights, C. B. W. Ryckman.....	Rec.
Best Guineas, James McKeen.....	Rec.
Best Madagascar rabbits, James McKeen.....	Rec.
Best colored Guineas, James McKeen.....	Rec.
2d best, Frissel fowls, James McKeen.....	Rec.
Best English ferrets, J. K. Tyrrell.....	Rec.
Best white rabbits, Albert Hooper.....	Rec.
Best Maltese rabbits, Albert Hooper.....	Rec.
Best trio Guineas, C. W. Jones.....	Rec.
Best squirrels, Benj. Edwards.....	Rec.
Best copper Bronze turkeys, John O'Brien.....	Rec.

## DIVISION D.

## CLASS 23. — GRAIN.

Best navy beans, D. T. Pilgrim.....	\$2 00
2d best, Thomas Davis.....	1 00
Best bushel of barley, Geo. Jeffrey.....	2 00
2d best, W. W. Wright.....	1 00
Best bushel buckwheat, D. T. Pilgrim.....	2 00
2d best, Geo. Jeffrey.....	1 00
Best bushel white dent corn, Thomas Davis.....	2 00
2d best, Lewis Davis.....	1 00
Best bushel yellow dent corn, Elihu Hall.....	2 00
2d best, A. Quick.....	1 00
Best bushel white flint corn, D. T. Pilgrim.....	2 00
2d best, Elihu Hall.....	1 00
Best bushel yellow flint corn, John Dey.....	2 00
2d best, Eli Stilson.....	1 00
Best bushel any other variety of flint corn, Elihu Hall.....	2 00
Best bushel white oats, D. T. Pilgrim.....	2 00
2d best, Geo. Jeffrey.....	1 00
Best bushel black oats, D. T. Pilgrim.....	2 00
Best bushel field peas, Edwin Nye.....	2 00
2d best, D. T. Pilgrim.....	1 00
Best bushel rye, D. T. Pilgrim.....	2 00
2d best, Geo. Jeffrey.....	1 00
Best bushel clover seed, Geo. Jeffrey.....	1 00
2d best, D. T. Pilgrim.....	1 00
Best bushel timothy seed, C. F. Rogers.....	2 00
2d best, Geo. Jeffrey.....	1 00
Best bushel club wheat, D. T. Pilgrim.....	2 00
2d best, Thos. Davis.....	1 00
Best bushel fife wheat, C. F. Rogers.....	2 00
2d best, D. T. Pilgrim.....	1 00
Best bushel Rio Grande wheat, Thos. Davis.....	2 00
Best bushel any other variety spring wheat, J. D. Trelevan.....	2 00
2d best, W. W. Wright.....	1 00
Best bushel white winter wheat, D. T. Pilgrim.....	2 00
Best collection by one exhibitor, D. T. Pilgrim.....	8 00
2d best, Geo. Jeffrey.....	4 00
Best black eyed marrowfat beans, M. B. Green.....	Rec.
Best flax seed, Thos. Davis.....	Rec.
2d best, D. T. Pilgrim.....	Rec.
Best marrowfat beans, C. F. Rogers.....	Rec.

# PREMIUMS AWARDED.

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## CLASS 24. — DAIRY.

Best jar of butter made in September, Mrs. E. S. Clapp.....	\$10 00
2d best, Chas. Ross.....	8 00
3d best, Mrs. J. Wilson.....	5 00
Best jar of butter made in June, Mrs. J. Wilson.....	10 00
2d best, Mrs. M. B. Green.....	8 00
3d best, C. F. Rogers.....	5 00
Best five dairy cheese, Geo. Rogers.....	10 00
2d best, H. Brockway.....	5 00
3d best, Edwin Nye.....	0 00
Best five factory cheese, D. J. Grossman.....	10 00
2d best, J. S. Noble.....	5 00
3d best, C. Vedder.....	0 00

## CLASS 25. — HOUSEHOLD.

Best two loaves graham bread, Emily Smith.....	2 00
2d best, Miss J. W. Hoglin.....	1 00
Best two loaves bread (hop yeast), Mrs. Geo. Badger.....	2 00
2d best, Julia Halpin.....	1 00
Best two loaves white bread, milk raising, Mrs. M. Hall.....	2 00
2d best, Lucinda Hall.....	1 00
Best two loaves Indian bread, Mrs. C. H. Root.....	2 00
Best sponge cake, Emily Smith (1st).....	1 00
2d best, Mrs. N. Hoglin.....	0 00
Best pound cake, Mrs. Geo. Badger.....	0 00
2d best, Emily Smith.....	1 00
Best jelly cake, Mrs. J. N. Hoglin.....	0 00
2d best, Emily Smith.....	1 00
Gold or silver cake, Emily Smith.....	0 00
2d best, Mrs. C. H. Root.....	0 00
Best fruit cake, Mrs. C. H. Root.....	1 00
2d best, Mrs. Geo. Badger.....	0 00
Best largest exhibition of cake, Mrs. C. H. Root.....	3 00
2d best, Emily Smith.....	2 00
Best spring wheat flour, Woodford, Foote & Co.....	2 00
2d best, Woodford, Foote & Co.....	1 00
Best winter wheat flour, Woodford, Foote & Co.....	2 00
Best exhibition baking powders, B. J. Musser & Co.....	3 00
Best exhibition flavoring extracts, B. J. Musser & Co.....	3 00
Best exhibition perfumery hairdressing, and baking powder pastry, B. J. Musser & Co.....	0 00

## BEEES AND HONEY.

Best largest product of honey, with sample, etc., A. H. Hart.....	\$6 00
Best bees, to be exhibited in hive or case, A. H. Hart.....	5 00
Best practical hive for profit, A. H. Hart.....	3 00
Best sample box honey, 111 lbs., A. H. Hart.....	3 00
Best extracted honey, 2 quarts, A. H. Hart.....	3 00
Best honey extractor, A. H. Hart.....	2 00
Best bees wax, A. H. Hart.....	2 00
Best Yeast cake, Waterloo Yeast Co.....	0 00
2d best dozen baking powder biscuits, Mrs. A. E. Coffin.....	0 00
Best ginger cookies, Mrs. Swift.....	0 00

## CLASS 26. — VEGETABLES.

Best two quarts Lima beans, J. Lewis.....	\$2 00
2d best, J. D. Van Doren.....	1 00
Best half bushel blood turnip beets, Brainard Bros.....	2 00
2d best, J. Lewis.....	1 00
Best half bushel long orange beets, J. M. Smith.....	2 00
2d best, Mayer Bros.....	1 00

Best half bushel mangel wurtzel, mammoth red, W. W. Lake.....	\$2 00
2d best, Mayer Bros.....	1 00
Best half bushel mangel wurtzel, yellow ovid, C. M. Clark.....	2 00
2d best, Mayer Bros.....	1 00
Best half bushel mangel wurtzel, Louis Imperial, James Servis.....	2 00
Best half bushel orange globe beets, J. C. Mitchem.....	2 00
2d best, J. D. Van Doren.....	1 00
Best mangel wurtzel beets, P. Hemetty.....	2 00
2d best, Brainard Bros.....	1 00
Best drumhead cabbage, any variety, John Dey.....	2 00
2d b st, Brainard Bros.....	1 00
Best Winningsstadt, James Lewis.....	2 00
2d best, John Nelson.....	1 00
Best half bushel early horn carrots, John Nelson.....	2 00
2d best, Brainard Bros.....	1 00
Best half bushel short horn carrots, J. Lewis.....	2 00
2d best, Brainard Bros.....	1 00
Best half bushel long orange carrot, J. Nelson.....	2 00
2d best, J. N. Hoglin.....	1 00
Best cauliflower, John Dery.....	2 00
2d best, James Lewis.....	1 00
Best dwarf celery, John Nelson.....	2 00
2d best, J. M. Smith.....	1 00
Best early sweet corn, W. W. Wright.....	2 00
2d best, J. B. Huntley.....	1 00
Best evergreen sweet corn, J. Nelson.....	2 00
2d best, E. W. Sanders.....	1 00
Best egg plant, J. D. Van Doren.....	2 00
2d best, J. Lewis.....	1 00
Best citron melon, W. W. Lake.....	2 00
2d best, J. M. Smith.....	1 00
Best muskmelon, any variety, Brainard Bros.....	2 00
2d best, E. W. Sanders.....	1 00
Best watermelon, J. K. Tyrell.....	2 00
2d best, J. M. Smith.....	1 00
Best half bushel red onions, J. Lewis.....	2 00
2d best, C. H. Scribner.....	1 00
2d best half bushel white onions, J. Nelson.....	1 00
Best half bushel yellow Danver onions, Edwin Nye.....	2 00
2d best, Brainard Bros.....	1 00
Best half bushel any other variety, J. Lewis.....	2 00
Best half bushel parsnips, J. M. Smith.....	2 00
2d best, J. Nelson.....	1 00
Best show large red pepper, Brainard Bros.....	1 00
Best show seedling potatoes, E. W. Sanders.....	3 00
Best half bushel early rose potatoes, A. Quick.....	2 00
2d best, J. Lewis.....	1 00
2d best half bushel peach blow potatoes, Thos. Davis.....	1 00
Best half bushel snowflake potatoes, J. B. Huntley.....	2 00
2d best, J. M. Smith.....	1 00
Best half bushel Brownell beauty, J. B. Huntley.....	2 00
2d best, A. Richardson.....	1 00
Best half bushel Camptoms' surprise, J. B. Huntley.....	2 00
2d best, A. Richardson.....	1 00
Best half bushel new variety, E. W. Sanders.....	2 00
2d best, J. M. Smith.....	1 00
Best half bushel Early Yellow Nansemond sweet potatoes, J. M. Smith.....	2 00
Best salisfy or vegetable oysters, J. M. Smith.....	1 00
2d best, Mayer Bros.....	50
Best Hubbard squash, Elihu Hall.....	2 00
2d best, J. K. Tyrell.....	1 00
Best fall squash, J. D. Van Doren.....	2 00

2d best, J. D. Van Doren .....	1 00
Best largest squash, any variety, J. D. Van Doren.....	2 00
2d best, Brainard Bros. ....	2 00
Best half bushel tomatoes, Brainard Bros.....	1 00
2d best, James Lewis. ....	2 00
Best half bushel flat turnips, J. N. Hoglin.....	1 00
2d best, J. M. Smith.....	2 00
Best half bushel rutabagas, Lewis Perit.....	1 00
2d best, J. B. Huntley.....	10 00
Best show by one exhibition, not less than fifteen varieties, J. Lewis..	5 00
2d best, J. M. Smith.....	Dip.
Best kohlrabi, L. Woodworth .....	Dip.
Best kohlrabi, J. Dey .....	

DIVISION E.

CLASS 27.—APPLES, PEARS, PLUMS, GRAPES AND WINES.

APPLES.

Best greatest variety, not exceeding fifty, E. Chase.....	\$8 00
2d best, H. Floyd .....	4 00
3d best, Geo. J. Kellogg.....	2 00
Best ten varieties adapted to northwest, D. T. Pilgrim.....	4 00
2d best, J. B. Huntley .....	2 00
3d best, Geo. J. Kellogg .....	1 00
Best five varieties adapted to northwest, J. B. Huntley.....	4 00
2d best, Nelson Olin .....	2 00
Best largest variety of winter, not to exceed twenty, H. Floyd.....	4 00
2d best, Geo. J. Kellogg .....	2 00
3d best, Nelson Olin .....	1 00
Best five varieties winter, H. Floyd .....	4 00
2d best, John Dey .....	2 00
Best show of ten varieties, without regard to adaptation, H. Floyd....	2 00
2d best, John Dey .....	4 00
Best largest variety autumn, not to exceed twenty, E. Chase .....	4 00
2d best, H. Floyd .....	2 00
3d best, Geo. J. Kellogg .....	1 00
Best five varieties autumn, J. F. Steele .....	4 00
2d best, Geo. J. Kellogg .....	2 00
Best show ten varieties, without regard to adaptation, E. Chase.....	4 00
2d best, Geo. J. Kellogg .....	2 00
Best plate of Red Astrachan, Nelson Olin .....	2 00
2d best, J. B. Huntley .....	1 00
Best plate of Duchess of Oldenburg, E. Chase.....	2 00
2d best, J. B. Huntley .....	1 00
Best plate of St. Lawrence, Geo. Jeffrey .....	2 00
2d best, D. T. Pilgrim .....	1 00
Best plate of Fameuse, J. B. Huntley.....	\$2 00
2d best, Geo. Jeffrey .....	1 00
Best plate of Utters, Elihu Hall .....	2 00
2d best, H. Floyd .....	1 00
Best plate of Plumbs' Cider, J. B. Huntley .....	2 00
2d best, H. Floyd .....	1 00
Best plate of Seek-no-Further, N. C. Hoyt .....	2 00
2d best, E. H. Beaton .....	1 00
Best Willow Twig, George J. Kellogg .....	2 00
2d best, L. Woodworth .....	1 00
Best Ben Davis, J. B. Huntley .....	2 00
2d best, W. W. Wright .....	1 00
Best Tallman Sweet, E. Chase .....	2 00
2d best, H. Floyd .....	1 00



## PREMIUMS AWARDED.

Best Golden Russett, J. N. Hoglin .....	\$2 00
2d best, J. B. Huntley .....	1 00
Best largest apple, J. F. Steele .....	1 00
Best heaviest apple .....	1 00

## PEARS.

Best greatest variety, James Ozane .....	3 0
2d best, D. F. Pilgrim .....	2 0
3d best, George Jeffrey .....	1 0
Best 3 varieties adapted to Northwest, Nelson Olin .....	3 00
2d best, Dr. James Ozane .....	2 00
3d best, George Jeffrey .....	1 00
Best single variety, T. H. Reiley .....	2 00
2d best, D. T. Pilgrim .....	1 00

## PLUMS.

Best exhibition, J. D. Van Doren .....	3 00
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## GRAPES.

Best show, 12 varieties, J. Brainard .....	8 00
2d best, George J. Kellogg .....	6 00
3d best, L. Hitchcock .....	3 00
Best 6 varieties, J. W. Arndt .....	4 00
2d best, James Brainard .....	2 00
3d best, George J. Kellogg .....	1 00
Best 5 varieties, adapted to Northwest, J. Brainard .....	3 00
2d best, George J. Kellogg .....	1 50
3d best, L. Hitchcock .....	1 50
Best 3 clusters Concord, J. N. Hoglin .....	2 00
2d best, Mrs. M. Stuart .....	1 00
Best 3 clusters, Delaware, J. N. Hoglin .....	2 00
2d best, Mrs. M. Stuart .....	1 00
Best 3 clusters Creveling, J. Brainard .....	2 00
Best 3 clusters, Walter, L. Hitchcock .....	2 00
2d best, W. W. Wright .....	1 00
Best 3 clusters Adirondac, L. Hitchcock .....	2 00
Best 3 clusters Isabella, J. Brainard .....	2 00
2d best, J. N. Hoglin .....	1 00
Best 3 clusters, Diana, Mrs. M. Stuart .....	2 00
2d best, W. W. Wright .....	1 00
Best 3 clusters Iona, L. Hitchcock .....	2 00
Best 3 clusters No. 3 and 4, L. Hitchcock .....	2 00
2d best, J. Brainard .....	1 00
Best 3 clusters No. 10, J. Brainard .....	2 00
Best 3 clusters No. 15, J. W. Arndt .....	2 00
2d best, James Brainard .....	1 00
Best 3 clusters No. 19, L. Hitchcock .....	2 00
Best 3 clusters No. 22, L. Hitchcock .....	2 00
2d best, No. 32, J. Brainard .....	1 00
Best seedling, Charles Fish .....	2 00
Best single variety, quality to rule, George J. Kellogg .....	2 00
2d best, J. Brainard .....	1 00

## CLASS 28. — DELICACIES, PRESERVES, ETC.

Best collection preserved fruits, Mrs. C. H. Root .....	\$5 00
Best sample preserved pears, Mrs. C. H. Root .....	1 00
2d best, Mrs. C. H. Root .....	50
Best sample preserved peaches, Mrs. C. H. Root .....	1 00
2d best, Mrs. H. M. Quick .....	50
Best sample preserved plums, Mrs. C. H. Root .....	1 00
Best sample preserved cherries, Mrs. C. H. Root .....	1 00
Best sample preserved strawberries, Mrs. H. M. Quick .....	1 00
Best sample preserved raspberries, Mrs. C. H. Root .....	1 00



2d best, J. B. Huntley .....	50
Best sample preserved blackberries, Mrs. H. M. Quick ..	1 00
2d best, Mrs. C. H. Root .....	50
Best sample preserved currants, Mrs. H. M. Quick .....	1 00
2d best, Mrs. C. H. Root .....	50
Best specimen preserved grapes, Mrs. C. H. Root .....	1 00
Best specimen preserved crab apples, Mrs. H. M. Quick .....	1 00
2d best, J. B. Huntley .....	50
Best specimen preserved tomatoes, J. B. Huntley .....	1 00
2d best, Mrs. C. H. Root .....	50
Best collection of jellies, Mrs. C. H. Root .....	1 00
2d best, L. M. Taylor .....	50
Best specimen currant jelly, L. M. Taylor .....	1 00
2d best, H. Brockway .....	50
Best specimen apple jelly, L. M. Taylor .....	1 00
2d best, M. s. C. H. Root .....	50
Best specimen crab apple jelly, J. N. Hoglin .....	1 00
2d best, L. M. Taylor .....	50
Best specimen grape jelly, M. Hoglin .....	1 00
2d best, L. M. Taylor .....	50
Best specimen raspberry jelly, Mrs. C. H. Root .....	1 00
2d best, L. M. Taylor .....	50
Best specimen blackberry jelly, Mrs. C. H. Root .....	1 00
2d best, Mrs. C. H. Root .....	50

CANNED FRUITS.

Best collection canned fruits, Mrs. C. H. Root .....	\$2 00
Best canned apples, Mrs. C. H. Root .....	1 00
2d best, Mrs. C. H. Root .....	50
Best canned pears, Mrs. C. H. Root .....	1 00
2d best, Mrs. C. H. Root .....	50
Best canned peared peaches, Mrs. C. H. Root .....	1 00
2d best, Mrs. C. H. Root .....	50
Best canned whole peaches, Mrs. C. H. Root .....	1 00
2d best, Mrs. C. H. Root .....	50
Best canned plums, Mrs. C. H. Root .....	1 00
2d best, Mrs. C. H. Root .....	50
Best canned cherries, Mrs. C. H. Root .....	1 00
Best canned crab apples, Mrs. C. H. Root .....	1 00
2d best, H. Brockway .....	50
Best canned strawberries, Mrs. C. H. Root .....	1 00
2d best, Mrs. C. H. Root .....	50
Best canned raspberries, Mrs. C. H. Root .....	1 00
2d best, H. Brockway .....	50
Best canned blackberries, H. Brockway .....	1 00
2d best, Mrs. C. H. Root .....	50
Best canned gooseberries, Mrs. C. H. Root .....	1 00
Best canned currants, H. Brockway .....	1 00
2d best, Mrs. C. H. Root .....	50
Best canned grapes, Mrs. J. N. Hoglin .....	1 00
2d best, Mrs. C. H. Root .....	50
Best canned tomatoes, Mrs. C. H. Root .....	1 00
2d best, Mrs. C. H. Root .....	50
Best canned corn, H. Brockway .....	1 00
Best canned blackberries, Mrs. C. H. Root .....	

PICKLES.

Best and greatest variety, not less than six, Mrs. C. H. Root .....	\$3 00
Best preserved cherries, Mrs. H. M. Quick .....	
Best preserved wild plums, Mrs. H. M. Quick .....	
2d best, Mrs. H. M. Quick .....	
Best preserved Moner plums, Mrs. H. M. Quick .....	

## CLASS 29.—PLANTS AND FLOWERS.

Best display greenhouse plants in variety, I. Miles.....	\$5 00
2d best, Wm. Strever.....	3 00
2d best Oleander, in bloom, Wm. Strever.....	50
Best display Pelargoniums, I. Miles.....	1 50
Best Zonale Geraniums, Wm. Strever.....	1 00
2d best, I. Miles.....	50
Best Fragrant Geranium, I. Miles.....	1 00
2d best, Wm. Strever.....	50
Best Double Geranium, I. Miles.....	1 00
Best single specimen Geranium, I. Miles.....	1 00
2d best, Mrs. A. E. Coffin.....	50
Best Fuchsias, in bloom, Wm. Strever.....	2 00
2d best, I. Miles.....	1 50
Best single specimen Fuchsias, Wm. Strever.....	1 00
2d best, I. Miles.....	00
Best display Roses, Wm. Strever.....	2 00
2d best, Mrs. A. E. Coffin.....	1 00
Best single specimen Roses, I. Miles.....	1 50
Best variety Carnations, Wm. Strever.....	1 00
2d best, I. Miles.....	50
Best display of Double Petunias, Wm. Strever.....	1 00
2d best, I. Miles.....	50
Best hanging basket with growing plant, A. Brown.....	1 00
2d best, I. Miles.....	00
Best display Cacti in variety, A. Brown.....	2 70
2d best, I. Miles.....	1 50
Best single specimen, I. Miles.....	50
2d best, Mrs. A. Brown.....	30
Best general assortment of ornamental foliage, I. Miles.....	1 00
2d best, Wm. Strever.....	50
Best single specimen ornamental foliage, G. R. Lambert.....	1 00
2d best, I. Miles.....	50
Best display of begonias in variety, Wm. Strever.....	1 00
2d best, I. Miles.....	50
Best single specimen, I. Miles.....	50
2d best, Amor Brown.....	20
Best specimen English ivy on trellis, Miss M. A. Alcott.....	1 00
2d best, Wm. Strever.....	75
Best poinsettia, I. Miles.....	1 00
Best display of caladiums, I. Miles.....	2 00
Best smilax on a trellis, K. M. Hutchinson.....	1 00
2d best, I. Miles.....	50
Best fernery, J. B. Reese.....	2 00
2d best, I. Miles.....	1 00
Best single specimen house plants, any variety, Sadie Goe.....	2 00
2d best, K. M. Hutchinson.....	1 00

## CUT FLOWERS.

Best largest collection and best arranged cut flowers, Emily Smith, amateur.....	2 00
Best most artistically arranged floral design, K. M. Hutchinson.....	2 00
2d best, G. B. Reese.....	1 00
Best pair round bouquets, Kate Peffer.....	1 00
2d best, I. Miles.....	50
Best pair flat bouquets, Kate Peffer.....	1 00
2d best, I. Miles.....	50
Best pyramidal bouquets, Geo. Reese.....	1 00
2d best, Kate Peffer.....	50
Best most tastefully arranged basket bouquet, Geo. Reese.....	1 00
2d best, Emily Smith.....	50
Best bouquet everlasting flowers, Emily Smith.....	1 00

Best display phlox dromundi, Emily Smith .....	\$1 00
2d best, Geo. Reese.....	50
Best show of asters, Emily Smith .....	1 00
Best show of dahlias, Kate Peffer .....	1 00
2d best, I. Miles .....	50
Best show of pansies, Emily Smith.....	1 00
Best show of gladiolas, Geo. Reese .....	1 00
2d best, Kate Peffer, professional .....	50
Best show of verbenas, Emily Smith, amateur.....	.....
2d best Mary Prock, amateur .....	.....
Best show of verbenas Kate Peffer, professional .....	.....
2d best, I. Miles, professional .....	.....
Best show of pansies, I. Miles, professional.....	.....
Best largest collection and best arranged cut flowers, Kate Peffer, prof. ....	.....
Best and most artistically arranged floral design, I. Miles .....	.....
2d best, G. Reese.....	.....
Best pyramid bouquet, I. Miles, professional.....	.....
Best most tastefully arranged basket bouquet, Kate Peffer .....	.....
Best finest display and best arranged phlox, Kate Peffer.....	.....

DIVISION F.

CLASS 30. — DOMESTIC MANUFACTURES, ETC.

Best flannel, factory made, W. N. Coleman.....	\$2 00
2d best, W. N. Coleman.....	1 00
Best flannel, home made, James Wilson.....	2 00
Best rag carpet, Mrs. A. E. Coffin.....	2 00
2d best, J. P. Neis.....	1 00
Best woolen blanket, factory made, W. N. Coleman.....	2 00
2d best, W. N. Coleman .....	1 00
Best woolen blanket, home made, Mrs. H. M. Quick.....	2 00
Best white quilt, Mrs. F. Thrahl.....	1 00
2d best, Mrs. J. G. Harriman.....	50
Best cotton patchwork quilt, Mrs. P. S. Somberger.....	1 00
2d best, Mrs. A. J. Gier.....	50
Best log cabin quilt, Mrs. A. E. Coffin.....	1 00
2d best Mrs. W. F. Webster.....	50
Best quilt any material, Mrs. W. T. Vandewater.....	1 00
2d best, Fannie Locke.....	50
Best woolen yarn, factory made, W. N. Coleman.....	1 00
Best woolen yarn, home made, Jas. Wilson.....	1 00
2d best, Mrs. D. McAlister.....	50
Best men's woolen socks, Mrs. Spore.....	1 00
2d best, Mrs. Spore.....	50
Best women's woolen stockings, Mrs. H. Jones.....	1 00
2d best, Mrs. Spore.....	50
Best woolen mittens, Mrs. Spore.....	1 00
2d best, C. Sloat .....	50
Best worsted crochet tidy, Mrs. D. R. Curran.....	1 00
2d best, Mrs. G. Lane.....	50
Best netted cotton tidy, Mary Harg.....	1 00
2d best, Mrs. E. B. Fowler.....	50
Best rug, Mrs. A. E. Coffin.....	1 00
2d best Miss V. C. Williams.....	50
Best affghan, Mrs. Lane .....	1 00
2d best, Mrs. G. Lane.....	50
Best wool scarf, Mrs. Anesta.....	1 00
2d best, Mrs. C. Sloat .....	50
Best knit bed spread, Mrs. M. T. Vandewater.....	1 00
2d best, Mary Harg.....	50

Best tatted tidy, Mary Harg.....	\$1 00
2d best, Kate Taylor.....	50
Best tatted work, Millie Curran.....	1 00
2d best, Mary Harg.....	50
Best crochet cotten tidy, Emma Linda.....	1 00
2d best, H. A. Montgomery.....	50
Best knit breakfast shawl, Mrs. Burtis.....	1 00
2d best, Mrs. G. Lane.....	50
Best knit hood, Millie P. Curran.....	1 00
Best worsted embroidered bible cushion, Jennie Voheese.....	1 00
2d best, Mrs. Collins.....	50
Best worsted embroidered sofa pillow Mrs. A. P. Allen.....	1 00
2d best, Miss M. A. A'cott.....	50
Best worsted embroidered ottoman, Mrs. A. T. Glaze.....	1 00
2d best, Mary Harg.....	50
Best Java canvas embroidery, Mary Harg.....	1 00
2d best, Miss M. Quartermas.....	50
Best silk embroidery, Mrs. E. Kent.....	1 00
2d best, Miss Jessie Smith.....	50
Best specimen spatter work, Mrs. F. Thrall.....	1 00
Best hair pin cushion, Mrs. D. R. Curran.....	1 00
2d best, Nettie Ray.....	50
Best floss embroidery, Mrs. A. T. Glaze.....	1 00
Best worsted canvas work, Mary Hay.....	1 00
2d best, A. P. Allen.....	50
Best chenille embroidery, Mrs. B. H. Soper.....	1 00
Best worsted fruit, Miss M. E. Montgomery.....	1 00
2d best, Mary Hay.....	50
Best worsted flowers, Flora Houghton.....	1 00
2d best, Gertie Torney.....	50
Best worsted wreath, Mrs. J. D. Van Doren.....	1 00
2d best, Mary Hay.....	50
Best fancy knitting, hand work, Jas. Wilson.....	1 00
Best wax work, F. B. Claggett & Co.....	1 00
Best wax flowers, Mrs. A. T. Glaze.....	1 00
2d best, Kittie Jones.....	50
Best work in wax other than above, Wm. Burtiss.....	1 00
2d best, Mary Doum Gould.....	50
Best work in hair, Mrs. W. Vickerson.....	1 00
2d best, Mrs. K. M. Hutchinson.....	50
Best moss work, Mrs. Armor Brown.....	1 00
2d best, Miss C. N. Johnson.....	50
Best shell work, Mrs. A. Brown.....	1 00
2d best, Mrs. A. Brown.....	50
Best bead work, May L. Bliss.....	1 00
2d best, Mrs. Gib. Lane.....	50
Best agricultural wreath, Mrs. Armor Brown.....	1 00
Best specimen dried flowers, high school scholars.....	1 00
2d best, Mrs. A. Brown.....	50
Best specimen dried grasses in bouquets, Mrs. A. Brown.....	1 00
2d best, Mrs. D. R. Curran.....	50
Best lace work, Mrs. A. Snell.....	1 00
2d best, Mrs. C. Meyer.....	50
Best display of millinery, Salmon & Clark.....	dip
Best lamp mat, Mrs. A. T. Glaze.....	1 00
2d best, Mrs. A. Brown.....	50
Best set of embroidered under garments, Mrs. K. M. Hutchinson.....	2 00
2d best, Mrs. D. R. Curran.....	1 00
Best fine shirt, Mrs. E. Kent.....	2 00
2d best, Mrs. E. Kent.....	1 00
Best specimen leather work, F. J. Wilkie.....	1 00
2d best, Mrs. G. Houghton.....	50
Best specimen plain sewing by girl under 15, Jessie Johnson.....	1 00



# PREMIUMS AWARDED.

41

2d best, Nellie Kent.....	\$0 50
Best fancy door mat, Miss Millie Curran.....	1 00
2d best, H. A. Montgomery.....	50
Best fancy basket in wood or cone, Jennie Moulton.....	1 00
2d best, Mrs. Burtiss.....	50
Best hanging basket in bead work, Mrs. L. M. Thompson.....	1 00
2d best, Mrs. H. M. Quick.....	50
Best watch case in beads or embroidery, Mrs Nettie Ray.....	1 00
Best Ornamental basket in wood, R. Kenedy.....	1 00
2d best, Wm. Burtiss.....	50
Best specimen stuffed birds, not less than five, Mrs. A. Brown.....	2 00
2d best, C. Stevenson.....	1 00
Best specimen braided work, Mrs. Wm. Starkweather.....	1 00
2d best, Mrs. D. R. Curran.....	50
Best child's embroidered dress, Mrs. A. J. Geer.....	1 00
Best gentleman's dressing case, Miss Millie Curran.....	1 00
2d best, Mrs. G. Houghton.....	50
Best collection silk embroidery, Mrs. E. Kent.....	2 00
Best collection cotton embroidery, Mrs. D. R. Curran.....	2 00
Best exhibition flax spinning, Mrs. J. B. Swift.....	3 00
Best perforated card board, Millie Rich.....	2 00
2d best, Jennie Moulton.....	1 00
Articles worthy of mention, Mrs. H. M. Quick.....	2d Prem.
Feather work, Mrs. A. Brown.....	1st Prem.
Crochet table mats, Mrs. D. R. Curran.....	1st Prem.
Cotton embroidered baby skirt, Mrs. A. J. Geer.....	1st Prem.
Flannel embroidered baby skirt, Mrs. A. J. Geer.....	2d Prem.
Flannel embroidered shulder blanket, Mrs. A. J. Geer.....	2d Prem.
Ole linen tidy, Mrs. A. P. Allen.....	2d Prem.
One linen tidy, Ella Allen.....	2d Prem.
Basket relics, Mrs. H. M. Quick.....	1st Prem.
Stone pyramid, Mrs. H. M. Quick.....	1st Prem.
Canvas tidy, Mrs. D. R. Curran.....	1st Prem.
Ball bag, Mrs. D. R. Curran.....	1st Prem.
Worsted embroidered tidy, Millie Curran.....	2d Prem.
Embroidered chair, Mrs. A. T. Glaze.....	1st Prem.
Hair pin holder, Mrs. A. T. Glaze.....	1st Prem.
Muslin wreath, Mrs. A. Brown.....	1st Prem.
Chemise night dress, Mrs. H. Walter.....	1st Prem.
Skirt, Mrs. H. Walter.....	1st Prem.
Skirt, Mrs. H. Walter.....	1st Prem.
Case fancy articles, F. B. Clagget & Co.....	1st Prem.
Needle work, L. M. Taylor.....	1st Prem.
Fancy hanging basket, Miss M. E. Montgomery.....	2d Prem.
Table mat, eight shades, Emma S. Jones.....	1st Prem.
Canvass needle work, Emma S. Jones.....	1st Prem.
Corner bracket, needle work, Emma S. Jones.....	1st Prem.
Rose of Sharon, needle work, Mrs. J. H. Collins.....	1st Prem.
Burnt match box, Mrs. J. H. Collins.....	1st Prem.
Feather flowers Miss Nettie Ray.....	1st Prem.
Cotton embroidered pillow shams, Miss Sadie Goe.....	2d Prem.
Foot rest, Mamie McKay.....	1st Prem.
Card basket, Mrs. C. Meyers.....	1st Prem.
Embroidered hankerchief, Mrs. C. Meyers.....	2d Prem.
Zephyr work, Lucy Kellier.....	1st Prem.
Photograph receiver by girl under ten, Flora Houghton.....	2d Prem.
Match lighter, by girl under ten, Flora Houghton.....	2d Prem.
Crochet mats, Mrs. Awesta.....	2d Prem.
Scrap bag, Mrs. Awesta.....	1st Prem.
Card basket, Mary Hay.....	1st Prem.
Toilet mat by girl 9 years old, Susie Johnson.....	1st Prem.
Star lines tidy, Miss M. A. Olcott.....	1st Prem.
View holder, Mrs. Burtis.....	1st prem.

## PREMIUMS AWARDED.

Parlor mat, Miss M. Kenedy.....	1st prem.
Java canvas tidy, Mrs. C. H. Root.....	1st prem.
Cotton embroidery, Mrs. E. Kent.....	1st prem.
Handkerchief case, Miss Millie Curran.....	1st prem.
Embroidered pillow shams, Mrs. F. W. Flack.....	1st prem.
Cake doiley, Mrs. E. B. Fowler.....	1st prem.
Cake doiley, Mrs. E. B. Fowler.....	1st prem.
Fancy horse blanket, F. J. Jackson.....	1st prem.
Sofa pillow, plush worsted, Mrs. A. T. Glaze.....	1st prem.
Silk embroidered sofa pillow, Mrs. C. Meyer.....	1st prem.
Worsted and tape tidy, Jennie Adams.....	1st prem.
Fine collection wax works, Mrs. A. T. Glaze.....	1st prem.
Several articles card board, entered by Nellie Kent and Mary Hay, worthy of notice.	
2 cotton tidys made by a boy 11 years old worthy of notice, Jay Hinman.	

## CLASS 31.—NATURAL HISTORY.

Best collection in mineralogy, Uriah Davis.....	\$2 00
Best collection in entomology, Mrs. E. Assire.....	1st prem.
Best collection in entomology, H. Behren.....	2d prem.
Best collection illustrating the botany of Wisconsin, Allie Collins.....	1st prem.
Best collection illustrating the botany of Wisconsin, Nellie Harris.....	2d prem.

## CLASS 32.—WORKS OF ART.

Best original oil painting of Wisconsin landscape, Mary Osthaus.....	Dip. and \$3 00
Best original oil painting of Wisconsin landscape, Lillie Kimball.....	Dip. and 3 00
2d best, Miss Fern Pratt.....	2 00
Best portrait and oil, Miss Fern Pratt.....	Dip. and 3 00
2d best, L. M. Taylor.....	2 00
Best India ink portrait, Spink & Horton.....	Dip. and 2 00
2d best, Cook Ely.....	1 00
Best portrait in water colors, C. B. Manville.....	Dip. and 2 00
2d best, Cook Ely.....	1 00
Best solar photograph, Cook Ely.....	Dip. and 2 00
Best exhibition sun pictures, Spink & Horton.....	Dip. and 3 00
2d best, C. B. Manville.....	2 00
Best collections of coins or medals, Charles Radford.....	2 00
2d best, W. P. Coolbaugh.....	1 00
3d best, Charles Fulton.....	Dip.
Best collection of stamps, Albert Hooper.....	2 00
2d best, Wm. Nevitt.....	1 00
Best pen and ink drawing, Mary Osthaus.....	2 00
Best pencil drawing, students from the normal model department, and we think that each should have a diploma. They are all very fine.	
Mamie Shieds, Mamie McKoy, May Schriber, Fannie Clemens, Elnora Morgan, Carrie Harson, Mamie Hay.	

KATIE HATCH,  
ANNA BARNUM,  
CLARA JAMES,  
ELLA ALLEN,  
WENDELL HABER,

Judges.

Best map drawing of Wisconsin, Will C. Lawrence.....	Dip. and \$2 00
2d best, L. H. Patten.....	1 00
Best cone work, Mrs. Arvesta.....	2 00
2d best, Mrs. H. M. Quick.....	1 00
Best exhibition of printing in varnish, Allen & Hicks.....	Dip. and 2 00
Best exhibition of book binding, Robt. Hellard.....	Dip. and 2 00



Statuary, Jones & McAllister.....	Dip. and 2 00
Graining on wood, Andrew Willock.....	Dip.
Graining on glass, James Willock.....	Dip.
Coolbaugh, special premium.....	

W. P. COOLBAUGH.

CLASS 33. — TEXTILE FABRICS, CLOTHING, ETC.

2d best piece of doeskin, W. N. Coleman .....	\$2 00
2d best piece of cassimere, W. N. Coleman .....	2 00
2d best piece of satinete, W. N. Coleman.....	2 00

DIVISION G.

CLASS 34. — MANUFACTURES.

Best specimen of brick, Cook, Brown & Co.....	\$2 00
Best collection of drain tile, Cook, Brown & Co .....	2 00
Best cook stove, with furniture, K. M. Hutchinson.....	Dip. and 2 00
Best parl r stove, H. Krippene, Hasbrouck & Monroe.....	2 00
Best office stove, H. Krippene, Hasbrouck & Monroe.....	2 00
Best display of monuments and headstones, Heim & Abrams.....	5 00
Best cooking range, H. Krippene.....	
Best heating stove, K. M. Hutchinson.....	

CLASS 35. — LEATHER AND LEATHER MANUFACTURE.

Best traveling trunk, Smith Bros .....	\$2 00
Best ladies' satchel, Smith Bros.....	1 00
Best pair gents' summer boots, J. M. Rollins & Co.....	1 00
Best pair gents' winter boots, J. M. Rollins & Co.....	1 00
Best pair ladies' summer walking boots, J. M. Rollins & Co.....	1 00
Best pair ladies' winter shoes, J. M. Rollins & Co.....	1 00
Best pair gents' slippers, J. M. Rollins & Co.....	1 00
Best pair ladies' slippers, J. M. Rollins & Co.....	1 00
Best double carriage harness, F. J. Jackson.....	Dip. and 2 00
Best single or buggy harness, F. J. Jackson and L. F. Thomson, Dip. and 2 00	
Best farm wagon double harness, F. J. Jackson.....	2 00
Best single wagon harness, F. J. Jackson.....	2 00
Best gents' riding saddle, F. J. Jackson.....	1 00
Best horse collar, F. J. Jackson, Hastings & Barker.....	1 00
Best harness, F. J. Jackson.....	1 00
Best display boots and shoes of all kinds, C. A. Johnson & Co....	Dip.
Best display of traveling bags, Smith Bros.....	Dip.
Best fancy blanket, F. J. Jackson.....	1 00
Best assortment India rubber goods, J. M. Rollins & Co.....	2 00
Best toy trunk, Smith Bros.....	
Best valise, Smith Bros.....	

CLASS 36. — MANUFACTURES OF WOOD.

Best display of carriages and sleighs, Wm. Servis.....	\$10 00
2d best, Rudd & Holden.....	5 00
Best three seat carriage on platform springs, Thompson & Hayward..	4 00
2d best, Rudd & Holden.....	2 00
Best two seat top carriage, Rudd & Holden.....	3 00
2d best, Benedict & Schuman.....	1 00
Best single seat top buggy, Perkins & Clement.....	3 00
2d best, P. L. Smith & Co.....	1 00
Best single seat phaeton, Benedict & Schuman.....	3 00
2d best, Perkins & Clement.....	1 00
Best single seat open buggy, Rudd & Holden.....	3 00
2d best, Benedict & Schuman.....	1 00

Best hack sleigh, Rudd & Holden.....	4 00
Best two seat sleigh, Benedict & Schuman.....	3 00
2d best, Thos. W. Rice.....	1 00
Best lumber sled, E. D. Harris.....	2 00
2d best, E. D. Harris.....	1 00
Best single seat sleigh, Wm. Servis.....	3 00
2d best, Benedict & Schuman.....	1 00
Best lumber wagon, B. F. Moore.....	3 00
2d best, G. Morrison.....	1 00
Best display of barrels, meat and liquor, Wm. Wakeman Jr.....	1 00
Best specimen light barrel stock, Wm. Wakeman Jr.....	2 00
Best set of chamber furniture, B. H. Soper.....	Dip. and 2 00
Best spring bed, B. H. Soper.....	Dip. and 1 00
Best and handsomest bureau, B. H. Soper.....	Dip. and 1 00
Best display of parlor or drawing room furniture, B. H. Soper.....	Dip. and 5 00
Best easy chair, B. H. Soper.....	Dip. and 1 00
Best marble top table, B. H. Soper.....	1 00
Best marble top stand, B. H. Soper.....	1 00
Best mantel mirror, B. H. Soper 1st, H. Belnem 2d.....	Dip. and 1 00
Best display clothes frames, Peter Cameron.....	Dip. and 1 00
Best display ax helves, Frank Winslow.....	Dip. and 1 00
Best track su ky, Wm. Servis.....	
Best one runner, with improved shoe, J. Gillingham.....	
Best chairs, in variety, J. F. Atkinson.....	
Best democrat wagon, Streich Bros.....	
Best two seat buggy, Streich Bros.....	Dip.

## CLASS 37. — MISCELLANEOUS.

Best safety oil lamp, F. H. Bates.....	Dip.
Best model of Oshkosh high school, C. J. Dalton.....	Dip.
Best plow point, Wisconsin Plow Co.....	Dip.
Best zinc center piece, H. Krippene.....	Dip.
Best monitor oil stove, W. C. Starkey.....	Dip.
Best aggregate cross, Mrs. A. Brown.....	Dip.
Best air castle, Mrs. G. Lane.....	Dip.
Best jobbing sleigh, E. D. Davis.....	Dip.
Best excelsior sash balance, Jas. Hamer.....	Dip.
Best economy oil tank, Geo. F. Stroud.....	Dip.
Best Wilson & Everdeus force pump and oil tank, Geo. F. Stroud.....	Dip.
Best jacket tank, 25 gals, Geo. F. Stroud.....	Dip.
Best patent bung spout, Geo. F. Stroud.....	Dip.
Best self measuring faucet, Geo. F. Stroud.....	Dip.
Best wooden jacket cane, Geo. F. Stroud.....	Dip.
Best patent kerosene fillers, Geo. F. Stroud.....	Dip.
Best Piano, Geo. Mayer.....	Dip.
Best Organ, Geo. Mayer.....	Dip.
Best Organ, Geo. Mayer.....	Dip.
Best Organ, Geo. Mayer.....	Dip.
Best case jewelry, Geo. Mayer.....	Dip.
Best case silver ware, Geo. Mayer.....	Dip.
Best display, Geo. Mayer.....	Dip.
Best excelsior 3 masted ship, P. Wolff.....	Dip.
Best pair bobs E. D. Harris.....	Dip.
Best spurk arrester, A. W. Farrand & Co.....	Dip.
Best display silver plated ware, Racine Silver Plate Co.....	Dip.
Best barrel carrier, J. Gillingham.....	Dip.
Best specimen of glass, Omro Glass Co.....	Dip.
Best specimen grain grown on B. R. R. lands, W. E. Cole.....	Dip.
Best pie lifter, Michael Getman.....	Dip.
Best home made confectionery, G. N. Heth.....	Dip.
Best wooden horse collar, J. K. Pompelly.....	Dip.
Best wooden horse collar, J. K. Pompelly.....	Dip.

Best largest range of work sewing machine, H. J. Eubank.....	Dip.
Best ease of management, H. J. Eubank.....	Dip.
Best easy learned, H. J. Eubank.....	Dip.
Best self threading shuttle, H. J. Eubank.....	Dip.
Best self setting needle, H. J. Eubank.....	Dip.
Best self threading throughout, H. J. Eubank.....	Dip.
Best work in leather, H. J. Eubank.....	Dip.
Best sample on clothes, H. J. Eubank.....	Dip.
Best braiding, H. J. Eubank.....	Dip.
Best binding, H. J. Eubank.....	Dip.
Best extension table, H. J. Eubank.....	Dip.
Best excelsior plaiter, A. J. Decker.....	Dip.
Best circular saw guide, Bryce & Growberg.....	Dip.
Best White shuttle sewing machine, White, Fuller & Co.....	Dip.
Best black walnut frame, W. N. Keneday.....	Dip.
Best worsted and tape daisy tidy, Jennie Adams.....	Dip.
Best book of engraving, Mrs. C. Johnson.....	Dip.
Best accordions, Geo. Mayer.....	Dip.
Best myrtle tree, Alvina Raner.....	Dip.
Best case of corsets, Everest & Bodine.....	Dip.
Best clothes reel, C. M. Conlan.....	Dip.
Best display fancy articles, F. B. Clagget & Co.....	Dip.
Best display of printing, Allen & Hicks.....	Dip.
Best display of perfumery, flavoring extracts and fancy articles, B. J. Musser & Co.....	Dip.

CLASS 38. — MACHINERY AND FARM IMPLEMENTS.

Best plow for turning sod land, M. K. Dahl.....	Dip.
Best plow for turning under stubble, M. K. Dahl.....	Dip.
Best plow for general work, M. K. Dahl & Streich Bros.....	Dip.
Best steel plow, M. K. Dahl & Streich Bros.....	Dip.
Best Harrow for general use, Fond du Lac Harrow Co. and Geo. H. Pounder.....	Dip.
Best one horse cultivator, Philip Marcer.....	Dip.
Best straw and stalk cutter for hand power, A. C. Little and J. H. Meers.....	Dip.
Best seed sower and cultivator combined, Harris Manufacturing Co. and Wheel and Seeder Co.....	Dip.
Best seed sower and roller combined, Wheel and Seeder Co.....	Dip.
Best two horse broad cast sower for grain, Van Brunt & Davis, and Appleton Manufacturing Co.....	Dip.
Best corn and bean planter for hand use, S. M. Scott.....	Dip.
Best combined mower and reaper, with or without self-rake attachment, Warner, Mitchell & Co., and I. J. Dexter.....	Dip.
Best reaper with self-raking attachment, Harris Manufacturing Co.....	Dip.
Best reaper without self-raking attachment, J. R. Smith & Son.....	Dip.
Best harvester with self-binder attachment, Gammon & Dearing.....	Dip.
Best mowing machine, Harris Manufacturing Co., A. Adams.....	Dip.
Best hay press, W. J. Hanna & Co.....	Dip.
Best threshing machine, Sawyer Manufacturing Co.....	Dip.
Best portable post driver, Ira Hardy.....	Dip.
Best windmill, Althouse, Wheeler & Co.....	Dip.
Best farm gate, Frank Lair.....	Dip.
Best windmill with pump combined, Althouse, Wheeler & Co.....	Dip.
Best engine and steamer combined, Beach & Morse.....	Dip.
Best paper cutter, Ketchum & Morgan.....	Dip.
Best display wooden pumps, Althouse, Wheeler & Co.....	Dip.
Best engine with sawing machine attachment, Shomer & Galliger.....	Dip.
Best horse power, Sawyer Manufacturing Co.....	Dip.
Best dray wood sawing machine, hand power, J. C. Hussey.....	Dip.
Best portable wood saw, Shomer & Galliger.....	Dip.
Best Cleveland riding cultivator, L. Sackett.....	Dip.

Best Sprague & Sackett's corn cultivator, L. Sackett .....	Dip.
Best American cider mill, L. Sackett.....	Dip.
Best Young America cider mill, L. Sackett..	Dip.
Best Cleveland corn sheller, L. Sackett.....	Dip.
Best Eureka riding plow attachment, L. Sackett.....	Dip.
Best Ithaca rake, L. Sackett.....	Dip.
Best self-dumping attachment, L. Sackett.....	Dip.
Best slip tooth for cultivator, L. Sackett.....	Dip.
Best sulkey corn plow, Emerson & Co.....	Dip.
Best Eagle reaper, J. B. Davids.....	Dip.
Best display of Machinery, Harris Manufacturing Co.....	Dip.
Best horse hoe, cultivator and potatoe digger, Appleton Manufacturing Co .....	Dip.
Best Turbine water wheel, C. C. Paige .....	Dip.

## VICK'S SPECIAL PREMIUMS FOR CUT FLOWERS.

- Best Floral ornament, Geo. B. Reese.  
 2d best, Emily Smith.  
 Best German myrtle, G. Mierswa.  
 Best lemon tree, G. Mierswa.  
 Best Cana, K. M. Hutchinson.

## THE FAIR OF 1876.

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The fair of 1876 will long be remembered by all who were in any way interested, especially so by those who were awarded premiums, and by the officers of the society — the former, by not being paid the premiums awarded them, and the latter, for the reason of their inability to pay — cause, “rain and snow” for the whole week. And yet, be it recorded, to the credit of most of the exhibitors, they took it patiently, and little complaint was made, but all regretted the unfortunate circumstance; for the first time in the history of the society, it was unable to meet its obligations.

The exhibition was the best ever held by the association, every department being filled to overflowing, and in this respect was gratifying to all, as it, in part, was an exhibition of the industry and wealth of the state.

The military review, on Wednesday, October 4, 1876, was one of the best features of the fair. The Sheridan Guards of Milwaukee, the Green Bay Light Guards and the Fort Howard Rifles were present, and, for soldierly bearing and gentlemanly conduct, these companies cannot be surpassed.

Hon. Gabe Bouck, being present, was called out, and gave the “Boys in Blue” a few words of genial welcome, as follows:

*To the military organizations that are here present:* Unexpectedly I have been called upon in behalf of the Northern Agricultural Association to respond to the military. In behalf of the Northern Association I now here welcome you to-day. I not only welcome you, but, in behalf of this association, thank you for the public spirit that you have exhibited in being present here to-day, in assisting this association, whose purposes only are to promote the agricultural, the mechanical and other industries of the country. The spirit that you have exhibited is worthy of the young men of the country. We thank you, Sheridan Guards, that have made the sacrifice to come this long distance to aid and promote our object and purpose. We thank you, from Green Bay and Fort Howard, who



are a part of our own citizens. And permit me to briefly say that I, as well as this association, have a high respect for the volunteer associations of our country. In a government like ours, where we have no standing army, in time of war the government depends upon the volunteers and upon our regular standing army. In time of peace, in cases of emergency, we depend upon our volunteer military companies, and you, young men, who make not only the sacrifice of your time, but the pecuniary sacrifice to maintain these organizations, are entitled to the thanks of the entire community. I will say here, we regret (and it shall not be repeated) that there is not a military company at Oshkosh to receive you; but it is on account of unforeseen circumstances, beyond our control, and I pledge you, upon my honor, that if you ever come to the Northern Association again, there shall be a volunteer company of Oshkosh to receive you, if I am obliged to equip it myself. [Great applause.]

Again, in behalf of the Northern Association, and in behalf of the people, we thank you for the sacrifices you have made, and the public spirit you have evinced in coming from your homes to aid and assist this organization. [Applause.]

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## FACTS FOR FARMERS AND THEIR SONS.

BY HON. R. J. OGLESBY.

In introducing Gov. R. J. Oglesby, the president spoke of the eminent men who had been engaged by the association to deliver the annual addresses in years past as being men of national fame, and alluded to Gov. Oglesby as the peer of the former speakers, and one whose labors for right and justice were worthy of the same national reputation. Gov. Oglesby spoke as follows:

*Mr. President and Gentlemen:* I am here to-day, not to discuss precisely agricultural or mechanical questions, but a question very closely akin to agriculture. Your president has seen fit to present me to you in the most flattering language. I am no orator; I am a very plain man. I do not move in the atmosphere of the illustrious names mentioned by him as the men who have addressed you



on former occasions. I belong to the masses, the uneducated masses of the country. I am no statesman, nor have I earned any national reputation in any just sense. Before I shall have concluded what I will say to-day you will find that I am a man who deal in plain language. I have been accustomed to addressing plain people, about such people as I see around me here to-day. You look like any Illinois audience; behave like an Illinois farmers' audience. I regret that the day is so uncomfortable, and that you can in no sense be comfortable while standing here listening to the remarks that I shall make. Your association took the great risk of asking me to come, and your distinguished senator, present on the ground to-day, encouraged me to come. He said he thought I could get along *measurably* well with a Wisconsin audience. I am by no means a good penman. To write a speech is a work of great labor to me, and the English grammar has been the standing terror of my life. [Laughter.]

I have grown up among farmers for the forty years that I have been a citizen of Illinois. I know that the great northwest, aye, the great Union itself depends for its prosperity alone upon agriculture. It is the basis of national wealth; the basis of national prosperity; and I think I do not go too far when I say it is the just basis of American civilization. We look to it as the infant looks to the mother, for encouragement, for support and for protection. But for our rich land and our nation of farmers, we should cut a poor figure in this world. I have not been favored with an opportunity of looking through the fair. I came but this morning. The day has been most inclement, and I have therefore been denied the pleasure of looking over the articles gathered together here for exhibition and exposition. I would have been glad indeed to have gone through the ground before appearing before you; I might have caught some inspiration from the grand show; still, it is my duty, and I will try to make it my pleasure, to speak upon matters pertaining to the farming industry. I have chosen the public domain of the United States as a suitable subject upon which to submit some remarks to-day. Not that I expect to enter into a history of the possessions of the United States at the time of our recognition as a nation by the other powers of the earth, nor of the successive acquisitions of territory since that time. These, indeed, would be found interesting questions, but they open a field of research

over which I have not found the time to travel, nor the inclination to carefully study. You will remember that at the treaty of peace in 1783, all the public unsurveyed and unoccupied lands within our acknowledged boundaries were either owned or claimed by the several states, and that subsequently those states surrendered them to the United States. At that time, excluding the area in the thirteen old states and including all other from the lakes on the north, to the Gulf of Mexico on the south, extending as far west as the Mississippi river, far as our nation and possessions then reached, there were about two hundred and twenty-six millions of acres, or three hundred and forty thousand square miles of public lands belonging to the United States. Subsequently, and first in order, came the Louisiana purchase under president Jefferson in 1803, from France, which added to the national domain an empire of acres, reaching from the Gulf to the British possessions, and extending to the Pacific ocean. Then followed the Florida cession of 1819, from Spain. The admission of Texas and the Mexican cessions of 1848 and 1853, giving us a grand frontage upon the Pacific ocean and the Gulf of Mexico, and swelling our public lands from two hundred and twenty-six million acres in 1782, to one billion four hundred and sixty-eight thousand and eight hundred acres in 1853.

Nor will I consider the equally interesting question of our public land system, founded in wise and just legislation, holding constantly in view the cardinal purpose to divest, in time, the title of the government to all agricultural lands, and to convey to and vest in the citizens the ownership, in suitable quantities, of the whole body of it; the plan of surveying the public lands into townships, sections and subdivisions of sections, first applied in the eastern part of Ohio, and steadily improved and extended until it has reached over every state and into all the territories, a complete and harmonious system, securing to every occupant absolute certainty of quantities and boundaries, and thus making all secure in the possession of homes and estates, is a marvel of wisdom and economy.

Again it would be a subject of no little interest to consider the various statutes and methods adopted by the United States in carrying out its policy of disposing of the public lands for the purpose of cultivation under private ownership.

Take the annual report of the commissioner of the general land office, and you will find such items as these: First, during the year

ending June 30th, total cash sales. Second, aggregate of military bounty land warrants located. Third, total quantity taken by homesteads for actual settlement, and Fourth, under the preëmption laws. Fifth, approved as swamps in place to the several states. Sixth, selected as swamps indemnity. Seventh, agricultural and mechanical land scrip: Eighth, for educational and college purposes. Ninth, grants for railroads and canals, and so on. Showing year after year for nearly a century how this treasure of wealth has been drawn upon by the munificence of the government. Interesting as it might be in more skillful and experienced hands, of these important branches of this great subject, I have chosen rather to confine my remarks to a more elevated field, and to look at one or two more practical branches of the question:

First. What is the amount, in acres, of good agricultural lands still held by the United States; lands fit for cultivation in the modes with which you are acquainted, without artificial irrigation; lands which may be taken up by cash entries by preëmption and under the homestead law?

Second. What is the true character of the arid region, or as we sometimes say, the desert portion of our public domain. How much of it is a barren waste, hopelessly dedicated to nonproduction, not only of the cereals, but even of grass, and so far as we now know, utterly worthless for any agricultural purposes; totally valueless, save for its mineral wealth, which I do not propose to consider to-day?

I have thought a brief discussion of these two points might bring home to our farming community some satisfactory information about the subject of our lands, and perhaps have the effect to make men more contented with their present lot and condition in life, and possibly throw some light on the value of our present real estate possessions in the northwest. I am not going into the question of how much is under cultivation; how much is held by states or railroad corporations, or speculators to be again sold at an advanced price to the actual settler, but mean to be understood as speaking alone upon the quantity of public land still owned by the government which may be taken up by the actual settler under the present laws of Congress. I have chosen to narrow this subject to these brief limits for one or two reasons — I am satisfied that there is a prevailing but very erroneous opinion in the public mind as to

the quantity of desirable, available, agricultural land yet held by the United States. As far as I can do so, by representing this subject as accurately as I can, I desire to disabuse the public mind of the country of this opinion, and if I can do so, to render the people of Wisconsin, the farming people, as I would willingly do the people of the entire northwest, more contented with their condition; render them, if possible, more satisfied with their farms as they now hold them, and the agricultural lands as they now possess them. In order to bring this subject home to this people and to familiarize myself with it somewhat (for it so happens that I am on the committee of public lands, as a member of Congress), I called upon a gentleman of great experience and great ability, Professor Powell, who has in charge the geological and geographical surveys of our desert or arid land; who has traveled over them extensively and who has measured them. I called upon him to furnish me with statistical tables, so that I should feel perfectly sure that any remarks I would make here could be reliable, so that our people might know that what was said on this subject was the truth absolutely, or approximately; as nearly so as examination, as surveys, and as reflections upon the subject can make it.

Whilst I know that a portion of this will be uninteresting, yet, if you will listen to the tables, or look over them hereafter, you will have left in your mind a pretty correct impression of what the public lands of the government are to-day. I suppose the subject has some relation to farming. I supposed it would be of some interest to farmers, possibly mechanics. It ought to be of interest to every American citizen. The Republic is as large as it ever was; the flag floats over as much territory as ever; the jurisdiction of the general government is as all expansive and as all powerful as ever, the government is as strong, and I hope under the favor of Almighty God, shall be as enduring as we can hope it shall be, who most dearly, most truly, most earnestly love it. (Applause and cheers.)

But practically, aside from government, aside from dominion, another question perpetually arises, and that is, how much land of any value is left under the policy of the government of transferring title to the citizen and not retaining it itself. How much is yet left to be got into possession of directly from the government and not through corporations, states, or speculators. How much is left



to be got hold of and occupied by the young women and young men, by our children rapidly tramping along on our heels. You and I and our fathers have been greatly blessed. We had only to leave the eastern states or southern states and come west to Ohio, Indiana, Illinois, Wisconsin, Iowa, or Minnesota, and choose the fairest portion of God's earth for a home, without competition and without restraint. Men and women of Wisconsin, those happy days have gone by, that prolific period has passed beyond our reach. I will leave out Alaska all the time. It is away off beyond the British possessions. Mr. Seward bought it for us as a matter of pastime and pleasure, and as Uncle Sam had for many years been in the habit of owning a large domain and it began to look as though it might run out.

The area of the public domain of the United States, excluding Alaska, is 1,957,955,160 acres, or equal to three million and twenty six thousand square miles, which would make fifty-six states as large as Wisconsin. Now then, if you include Alaska, there are three hundred and sixty-nine millions acres in that, equal to five hundred and and seventy-seven thousand square miles, which would make ten states as large as Wisconsin. Putting the area of the United States and all the territories with Alaska, and we own two billion three hundred and six million acres of land, equal to three million, six hundred and three thousand square miles, equal to sixty-seven states as large as Wisconsin. In one portion of the United States the rainfall is sufficient for agricultural purposes, and this may be styled the Humid Region, another portion where the rainfall is insufficient for agriculture, and this may be styled the Arid Region. Long experience has shown that where the annual rainfall is less than twenty-six inches, agriculture is not possible without artificial irrigation. Run a line from the northwest corner of the state of Minnesota, in a gentle curve to the southwest so as to leave on the eastern side of the line a small portion of the southeast corner of Dakota territory, and continue the line southward so as to leave one-third of Nebraska on the eastern side of the line, and five-ninths of Kansas, and the greater portion of Indian Territory, and still continue it across the state of Texas to Fort Duncan on the Rio Grande del Norte, thus dividing the state of Texas into two equal parts, and the arid portion of the west will be divided from the humid or agricultural portion of the east of the United States.

This line is but an approximation; there is a narrow belt along the entire line on the eastern side, where agriculture is uncertain by reason of the great aridity; but it may be safely said that all to the westward is too arid for successful agriculture. There is an exception to this in the western portion of Washington Territory and in the state of Oregon, and the northwest part of California where the great Pacific air-currents come laden with moisture, so that the rain-fall is sufficient, and in a northwest portion of Washington territory it is even excessive.

By an examination of the map, it will be seen that the territory thus indicated as arid is about one-half of the whole territory of the United States, excluding Alaska.

The following is the amount of the arid region by states and territories: In Arizona there are seventy-two million acres in the arid region. In California there are sixty million acres. In Colorado, sixty-six million. In Dakota, ninety-one million. In Idaho, fifty-five million. In Kansas, twenty-four million. In Montana, ninety-two million. In Nebraska, thirty-six million acres of arid land, that are nonagricultural without artificial irrigation. In Nevada there are sixty-six million. In New Mexico, seventy-seven million. In Oregon, forty million. In Utah, fifty-four million. In Washington Territory, twenty-nine million. In Wyoming, sixty-two million. In Texas, eighty-seven million. In Indian Territory, fourteen million; making as a total of arid, desert land, not fit for agriculture, nine hundred and thirty-four million, five hundred and ninety-nine thousand, eight hundred and seventy-five, or one million four hundred and fifty-nine thousand square miles; an area twenty-seven times the size of the state of Wisconsin. The humid region contains 1,023,356,000 acres, just a little in excess of the arid region, equal in area to twenty-nine and two-thirds times the size of the state of Wisconsin.

The humid region, including all the old states and the new states, the territory this side of that line I spoke of awhile ago, running from the forty-third parallel to the Rio Grande del Norte; all the territory where the rain falls copiously enough to produce crops without irrigation, would make twenty-nine states of the size of Wisconsin. Your state has 54,000 square miles, and is far above the average size of the states. Having given you some idea of the arid desert land, I now call your attention to the amount of public



lands unsold in the humid, or rainy, or wet weather region of the United States. The amount is a little less now than these figures, because these figures only included the year that ended June 30th, 1875. A small portion of it was undoubtedly taken up this year. Here is the point I wish particularly to call your attention to. What is the quantity left of farming or agricultural land still in the possession of the United States?

	Acres.
In Florida there are.....	17,000,000
Alabama.....	4,000,000
Louisiana.....	5,000,000
Mississippi.....	3,000,000
Arkansas.....	8,000,000
Michigan.....	1,000,000
Wisconsin.....	5,000,000
Iowa.....	545,000
Minnesota.....	25,000,000
Washington Territory.....	1,000,000

Making a total of agricultural land, where farming can be carried on, as I again wish to impress upon your mind, *without* irrigation, of but seventy-three million acres, an area equal to twice the size of the state of Wisconsin, if it were all put together. I want to talk a little about this land. It is not all of it agricultural land. There are serious deductions to be made from that 73,000,000 acres. It will be seen that seventeen million acres of this land are in Florida, and embrace what are known as the everglades of that region, a vast morass with islands of jungle, many of which are floating.

In Alabama, Louisiana and Mississippi, there are 3,256,027 acres, or twenty thousand square miles, still unsold. These are chiefly low bottom lands, of no value until they are redeemed by the construction of great levees, or by other engineering methods, and their reclamation will cost many millions of dollars, and the enterprise is so great that only the general government or the state government can undertake it.

In Arkansas there are eight millions of acres still unsold. These lands are chiefly sterile hills and mountains, and are of but small value for agricultural purposes. In Michigan, Wisconsin, Iowa, and the humid portion of Minnesota, there are thirty-two million acres, or thirty-one thousand square miles, in the possession of the government. These lands are of variable values, but a very small portion of them are first-class lands. The whole amount of such first-class lands would be less than enough to make an area as large as the state of New Jersey. In the humid portion of Washington

Territory the government still owns one million acres of land, approximately, about enough to make an ordinary county in Wisconsin. It will thus be seen that the first-class lands available for settlers in the humid portion of America, if thrown together in one body, would not make an area as large as Chippewa county, in the state of Wisconsin.

Now, I am coming to the results of this investigation. You see, gentlemen, how little of this public domain is within your reach. You see how little is left to which you can get a title directly from the government. I am not calling your attention now to what has been taken by private individuals, by states, by railroads, or by speculators, all of which is still held by them, and but little of which is under cultivation. I am not discussing that view of the subject at all. I am only trying to rivet your attention upon the amount of the public land that belongs to the United States, which you can get to-day by settling upon it under the homestead law, or under our preëemption law, or actual cash purchase.

I would be happy, could I believe that all that arid region, all that desert region, all that mountain region, as the great northwestern states, was adapted to the purposes of agriculture, and that our children coming after us might go there and find comfortable homes, as our fathers and ourselves found comfortable homes here in these fair plains of the northwest; but it is not so. It is not right for a legislator or a farmer to consider the question by listening to what some enterprising man in the new state of Colorado would say, or to what some energetic speculator in Nebraska or Kansas would say, anxious for people to go west. You should not be led by statements and representations from that source, but be led by the facts as they are found by actual surveys, and as we know they are in truth to-day. Having said this much about the humid region, let me again invite your attention more specially to this arid region west of the ninety-seventh, or even, as some say, the one hundredth meridian. In this region agriculture is dependent on artificial irrigation; that is, the waters of the creeks, rivers and lakes must be taken out in canals and spread over the land from time to time during the growth of every crop. This is an expensive operation, the amount of such expense per acre depending on the character of the stream to be utilized. Where the streams are small, and other circumstances favorable, such land can often be irrigated at an annual

expense of from four to five dollars per acre, but where larger streams must be taken out, the expense of building canals varies from four to five dollars per acre, in training the water among the growing crops.

It will thus be seen that this is no country for a poor man to make a farm; agricultural operations larger than a mere garden can be carried on only by men of wealth, and in many cases it is necessary to form large stock companies for the redemption of the land.

It would be interesting to know how much of this arid portion can thus be redeemed by artificial irrigation. Now, mind you, there are nine hundred and thirty-four millions of acres of it. How much of it can be redeemed by irrigation? Without stopping to give the details, I should say there is only about two per cent. of that 934,000,000 acres, about nineteen million acres, can be redeemed to agriculture by artificial irrigation, tapping every lake, every stream, and every fountain and source of water. The facts are startling and the result is astonishing, and I know full well the public mind has been in error upon this whole question of our public domain.

Of what value, then, is the remaining portion of the region? About one hundred and ninety-two million acres is composed of mountain crags and peaks, an area five and one-half times the size of Wisconsin. Let us see what portion of that desert land is in mountains.

In Arizona there are 16,000,000 acres, in California there are 21,000,000, and running on down through all the territories it foots up about 192,000,000, or 311,000 square miles of mountains fit for nothing upon God's green earth but their possible mineral wealth. There are fifty million acres of cañon country; that is, a country traversed by deep gorges, where all the streams run from two to three hundred to five or six thousand feet below the general surface of the country, and between these cañons are cliffs and peaks of naked rock; a region wild and desolate, and never to be inhabited.

Then comes the lava region of about the same amount of fifty million acres. The land is covered with lava, cinder cones and volcanic scoræ, the most desolate and valueless portion of North America. These volcanic regions are scattered in patches through

New Mexico, Arizona, Nevada, Utah, Idaho, Oregon and Washington.

Then comes the bad land region, and what I have been talking about is bad enough, but there are other regions of about sixty millions acres in extent, known as the Bad Lands. These are steep, naked hills, without soil and without vegetation, and are without value for agricultural purposes.

Next comes the desert region. In Arizona, Southern California and Southern Nevada, there are about eighty millions of acres, or 125,000 square miles of desert plains, with a surface of drifting sands and polished gravels, destitute of water and without vegetation. This gives us the following table :

	<i>Acres.</i>
Mountain region.....	192,000,000
Cañon region.....	50,000,000
Lava region .....	50,000,000
Bad Land region.....	60,000,000
Desert region.....	80,000,000
Making a total of .....	<u>432,000,000</u>

that can never be used with irrigation or without irrigation, an area of more than thirteen times the size of the state of Wisconsin. This leaves as a remainder about five hundred and one million of acres which cannot be redeemed by irrigation for want of water. It is made up of the great plains, covered with scant grasses, and having an area of 290,000,000 of acres, an area eight and one-half times the size of the state of Wisconsin, and the remaining portion of about 212,000,000 acres are the hills and valleys among the mountains, also having a slight value by reason of the scant grasses that grow on them.

The area of the great plains is 290,000,000 acres. The area of the mountains, hills and valleys is 210,000,000 acres, making a total of 500,000,000 of acres of pasturage land not entirely arid, not mountainous, not lava, not cañon, not bad land, not desert. This region can be used not for agriculture, but for pastoral purposes. The grasses are thinly scattered over a large extent of territory, and the pasturage is very scant, so that the lands are of no value in small quantities. A tract of land large enough for an ordinary farmer to make a living by stock raising must be several or many miles in extent. But eventually these grass lands will be set-



tled by people who will live many miles apart, where society, with schools and churches, will be impossible.

On the high plateaus and mountains of this region there are some forests. Where these forests are found the altitude is so great that frost is known in every month of the year, and these regions are thus unfit for agriculture.

But the arid region has a great store of gold, silver, copper, lead, iron, coal, and many other minerals, and eventually these lands will be worked, and the small amount of agricultural lands will be cultivated to their greatest capacity, to furnish supplies for a home market, and the cattle and sheep raised on the pasturage lands will also have a home market.

Gentlemen, I find that to go on with this subject in detail will weary your patience and wet your clothes. If the day had been pleasant I would have gone more cautiously and more carefully over this subject. I have no familiarity with science. I am not capable of talking about scientific agriculture. I know almost nothing of chemistry, so I could not make myself interesting in talking upon any scientific subject in connection with mechanics or farming, but I think I could have brought before this people, and in this way, to some extent before the mind of the west, some accurate information of the public lands and of the public land system of the United States. I only wish to impress upon you, as I do upon all western farmers, the fact that the period has gone by when women and men can go west and locate upon good farm lands. You, who have farms in Wisconsin, or lands not yet under cultivation, let me impress upon you one fact, and that is to hold on to them firmly. I tell every farmer of the great west, you are not the capitalists; you are the laboring men; you are the toiling men; you are the men who bring to the surface the hidden wealth that God has planted underneath. Be content with your lot. Keep the homes you have; cultivate, adorn and beautify them, but make up your minds that that period of going to the great west to populate new territories and make new states, as we made them here in years gone by, has departed, and forever gone from this land.

Our position, our future, is to cultivate the soil, to beautify the country, to build up the institutions, to settle down into the habits of industry, and into the habits of the old nations of the world. We are powerful; we are popular; we are wealthy; even in these



perverse hard times, we are a great and prosperous and wealthy people. Teach the young men and the young women of Wisconsin that their greatest comfort and happiness is to come rather from cultivating and improving the lands they now have, than from wandering or straggling cut westward in search of what they, in their fancy, believe to be more beautiful and attractive regions. They are not there; they are not to be found. There are only 19,000,000 of acres left to-day, that can be brought under cultivation by irrigation, and not enough first class agricultural land this side of that line in the humid region to cover one-fourth of the state of Wisconsin, if it was all brought together in one body. I tell you again, cultivate an attachment for your own homes, and stand by the soil you own. Be content with your lot here, for after a while the land in the hands of the private owners of all these great western states will double in value in less than ten years. When the people of the east, and the people of Europe, and the people of the west, find out that this great land region is exhausted, that the fertile plains have all passed into private ownership, that the public domain has all faded away, mark what I tell you; in less than ten years, all this land of ours will double in value.

Here is a great nation of intelligent people, a free thinking, liberal and warm hearted people, to occupy this republic for numberless centuries to come. They must all have homes, they must all be fed. Our natural increase would drive up in time the value of our real estate far beyond any present estimate put upon it.

You talk about society in the old world, you talk about the railroad corporations in the United States. Large companies control wealth. The men of the greatest wealth will be the land owners in the United States, as they are to-day, in the German Empire, in the French Republic and in the Kingdom of Great Britain.

They are the men of wealth and power to-day, and under our liberal system that scatters land into half or quarter sections, eighty acre and forty acre tracts, my only fear is that after a while wealth will seize hold of this valuable land; that after a while men with strong arms and strong purses will reach out and get possession of this land by millions of acres. When that time shall come, we will have in the United States what they have in England to-day, a great landed aristocracy. I hope that that time never will come. If our land shall be distributed to our children and held and cultivated

under separate and individual ownership, it never will come. But you nor I, nor any living man can forecast the future of this country.

Wealth is absolutely despotic. The laws of wealth are irrepealable and irreversible. You and I are subject to that dominion and power. We all come to this exhibition and contribute to this fair, every one of us, in the hope of bettering our condition; in the hope of climbing higher on the great ladder of life, in the hope of bringing about us wealth or the comforts that wealth can buy; therefore I say the laws of wealth are irrepealable and irrevocable. Wherever civilization goes they deeply root themselves into society. I would impress upon every farmer, be content with your possessions you now have, instead of going west to that arid region where thousands and thousands, year after year, are deceived and misled. Stay at home, stay in your happy land, abide by your firesides and you will have accomplished all that human agency can ever accomplish for humanity. I thank you most kindly for having listened to me under such unfavorable circumstances. I hope that the country that makes a home for us all, the grand old republic, may long stand; that it may safely be perpetuated from generation to generation, in the hands of its friends. That those who love it, those who stand most firmly by it shall be left in its keeping; that the old flag shall fly, that the republic shall live, that the Union shall stand, and we shall go on prosperously one century after another, as long as time shall last. [Loud applause and cheers.]

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## ADDRESSES OF SENATOR HOWE AND GOVERNOR LUD- INGTON.

*At the Fair of 1876.*

### SENATOR HOWE'S ADDRESS.

FELLOW CITIZENS: I believe your president keeps me here for the purpose of making postscripts to agricultural addresses. [Laughter.] I never have attained to the dignity of making an address, but I have been employed several times on postscripts. I thought I would escape even that duty to-day, but don't seem to be so for-

tunate as that. You remember, I trust, some one of the characters introduced to the reading world by Mr. Charles Dickens. I don't remember his name, but I remember this of him, that he was as stupid and as pretentious as I am, and he had a wife as smart and as capable as my friend Gov. Oglesby here. [Laughter and loud applause.] Whenever this gentleman heard any subject under discussion he knew it was proper for him to express an opinion, and he had just sense enough to know that he had better trust his wife with the expression of that opinion, and so his habit was to turn around and tell the old girl, as he called his wife, "Give them my opinion." Gov. Oglesby is the old girl that I take around with me to tell my opinion. [Loud laughter.]

It is evident that he has given you some sound sense. I noticed that he talked to you mainly about the public domain. He was talking of that portion of the lands of the United States out of which farms are yet to be made. He has proclaimed a new gospel here to-day. I embrace it. The old dispensation which has been preached to you for years, "Go west," is played out. At last you hear the truer and the higher gospel of "stay where you are, and hold on to what you have, and cultivate that, and make the most of that." Itinerancy does very well in some callings, but itinerant farmers are not much to boast of, and never will be. The question interests you as to what you ought to do with the private domain, with that portion of the lands of the United States already comprised in farms. I will tell you what I think farmers better do. I think there are two things necessary to secure the success of the farmer. One is to get good crops, and the other is to get good prices for them. You want to know how to get good crops. Well, I suppose you do know. You have been practicing, some of you a great many years, and the youngest of you have the benefit of the experience of the oldest. It is a very simple thing to know how to get good crops. Ask the president of this society. He knows. Why, that man not only gets good crops, but he gets three of them a year. He is, I suppose, about the best nurse for a soil. He nurses a soil very tenderly. He makes it very capable. He has contrived to defend a very mean, stingy soil against one of the enemies to which it is most exposed, that of drouth. You can't dry him up. He has a way of sprinkling his land, a pretty cheap way, and a very effective way. There are some things, however, that I

am afraid President Smith is not equal to yet. Some enemies that are a little too much for him. He may be a match for the chinch bug, and weevil, and grasshopper, but if he is, he is the only farmer that I know of that is equal to that sort of warfare. He says he fattens his turkeys on the grasshoppers. That is making a good market for the grasshoppers, but there are some neighborhoods where they cannot do that. The turkeys, even, are not equal to the grasshoppers. I mean to say on this point that I think the farmers need first of all, most of all, a broader and more generous course of study; greater intellectual development. I know there are some men who think you must have very learned men for doctors and ministers, lawyers and legislators, and tradesmen and mechanics, but that most anybody can be a farmer. I think that is an enormous mistake. I think it takes a larger culture, a broader study to know how to cultivate the soil as it should be cultivated, than it does to pursue any other one avocation. Almost any man, I know, if he is of fair muscular development, can hold a plow, can plant corn or dig potatoes. I have done all those things myself, little as I know, but that has very little to do with being a farmer. He must know how to compose a soil; to make it up. He must know how to adapt it to every crop that he wants to cultivate, and then he must understand the whole mystery of stock breeding. Just think about that man Budd Doble. I suppose a great many horses equal to Goldsmith Maid have been buried who gave no account of themselves. The world had to wait six thousand years for Budd Doble to arise, and finally he educated a horse and sent her whistling around a mile in 2:14; and how the world applauded when it was done. It is not necessary that every horse should do that, but when horses can be made to go a mile in 2:14, or four miles at the rate that Ten Broeck went it a few days ago; when they can be made to do such enormous feats as those, horses have no right to be such uncouth brutes as nine-tenths of the horses are that you see on your commons, and in your pastures. Profound education is necessary in order to produce the right kind of a horse and the right kind of oxen, and the right kind of cows.

Then you want better markets. Recollect you are feeding the world, and every man you feed is to work for you. I wish the farmers would understand this one thing, that they are the masters of all production, of all industry, and everybody else who toils,



toils for them. Mechanics of every description, manufacturers of all sorts and all the learned pursuits, or professions, as they are called, exist for the benefit of the farmers. Farming is the basis of all production. When bread and meat fail, everything fails, and bread and meat are produced to feed all these other professions, and they exist that bread and meat may be produced. In order to improve your markets I have but just one hint to give you to-day, and that is that you get all those who are working for you as near to you as possible, so that you will not have to send your bread and your meat to such great distance as you now send them. You are paying not less than \$20,000,000 annually for labor which is done on the other side of the Atlantic, and labor expended on three articles alone, iron, cotton and woolen. I think if you could have all that labor over here, and have all that work done close by you, that markets would be immensely improved because you would save all the transportation you now pay on your produce which you send abroad; all the transportation you pay on those fabrics which you bring back, and all the commissions which you pay to the army of middle men which stand between you and the consumers in foreign countries. One thing more, and then I will dismiss you. You want good crops, you want good markets, and I have only given you a couple of hints how to get good crops and how to get good markets. I think you want one thing more, my friends. I am speaking now in the style of a critic. I think farmers as a class want rather more faith, courage and belief than they have. I have seen men weighing 175 pounds avoirdupois, with mighty good appetites and perfect digestion, going drooping around and complaining of hard times. Now I protest against that. Such a farmer, with 160 acres of good land, makes the times to order if he knows how to work his land. Such a man is an American Grand Duke. What more do you want? Oh! you want money, eh! Why do you want money? That is the poorest trash in the world. You cannot eat money nor wear it, and those are the only necessities you have. You only want money to buy something else with. Why don't you buy it with wheat, colts, or hogs or corn? You do. That is the way you get your money. You get your money only to count; as a mere counter, a mere representative of the value of the things you have sold or the value of the things you want to buy. You only want money temporarily.



Other things you want permanently. Sometimes you say money is very tight. Why, my friends, there is as much money in the world to-day as there ever was, and more.

Sometimes, you say, the banks lock up the money and you can't get it. If I were the farming community I would just lock up the graneries. I wouldn't let the banks have any bread. You can stand it as long without money as they can stand it without bread. Take good care of what you produce; be masters of that, and you can make the banks unlock their vaults whenever you tell them to do so. When you think you are just about to die of hard times, let me give you a hint. One of the best remedies for that I know of, is to spread your table with roast beef and plum pudding. You can have those any day, and you need not call on the banks at all. Just do that, do it day after day until you get over the blues. You can prolong life a great while by just such an expedient as that. [Laughter.] Nay, if you do that every day I promise you that you will live forever. [Laughter and cheers, Gov. Oglesby saying that he would begin to do so to-morrow.]

I have made one convert right off but the trouble is that he don't produce the beef, and he can't get up the pudding unless he draws on one of you gentlemen. What is the use, for a man who can have three meals a day, all furnished from his own larder, to complain of hard times. If you undertake to confine those poor fellows who work for you, these doctors, ministers and lawyers and mechanics, to two meals a day, then we might complain of hard times with the same propriety, but for you, who have just as many meals as you can eat every day in spite of the rest of the world, there is no such thing as hard times. Do you remember what is said in the Acts of the Apostles about the day of Pentecost when all the nations of the earth were gathered at Jerusalem and there suddenly descended upon them the gift of tongues, and they found Jews talking like all the other nations of the world. Well, an exhibition something like that may be seen in our country at this day. Then, you know, Cretans, and Cappadocians and Pamphylians and Egyptians heard Galileans talking just like they and in their language. The difference between that day of Pentecost and this we are passing through is this, that now, we hear all sorts of folks, lawyers, doctors, ministers and especially politicians talking like patrons of husbandry or trying to talk like them. Before it became

quite the style to stand with the Grangers and be Grangers, I had occasion to tell the farmers of western Wisconsin what I thought of them, fourteen years ago. I tried to make them understand then their industry lay at the foundation of all industry, that they were captains of all production. Everything fails when you fail, and until you fail nothing else will. I tried to make them understand that gospel. I hold to that to-day. I remember, and you doubtless remember, when a senator from South Carolina, before the rebellion, undertook to taunt the farmers of the north with being the mud sills of society. He meant it as a reproach. A prouder compliment than that could not have been paid you. You are the foundation sills of society. You are those timbers on which the whole social fabric must rest, but because you are the foundation sills it does not follow that you should be rotten at all; on the contrary, it does follow that you should be of oak, sound to the core, and as long as you are that, the fabric reared above you will stand and when you fail to be that, that fabric will crumble. Recognize this position. Understand that you are the captains of all industry. Do not be disheartened, do not be discouraged. I want you to recognize your position and lift yourselves to it. Be wise, be free, and above all things, be brave.

GOV. LUDINGTON'S REMARKS.

Gov. Ludington being repeatedly called for, spoke as follows:

*Ladies and Gentlemen:*—I have got up here to make an exhibition of myself at the request of the president of the society. It is well known to the people of this state that I am no orator, although I am somewhat of a farmer. For me to attempt to teach you anything to-day, after the words you have heard, would be perfect folly, and furthermore I believe you are not in a situation to hear a speech. I thank you for the attention you pay me and for the prominence Mr. Smith has given me in introducing me to you.

President J. M. Smith then said:

It is known to most of you that Gov. Oglesby has been to great trouble and great expense to come here and talk to you. He comes for nothing and finds himself, and we can do no less than to give him a hearty vote of thanks.

A vote of thanks and three cheers were then given for Gov. Oglesby.

TABLE SHOWING THE WEIGHTS OF VARIOUS ARTICLES IN DIFFERENT STATES.

ARTICLES.	POUNDS PER BUSHEL.				
	Michigan.	Illinois.	Indiana.	Iowa.	Wisconsin.
Apples, dried.....					28
Apples, green.....					57
Beets.....					50
Barley.....	48	48	48	46	48
Beans.....	60	60	60	60	60
Buckwheat.....	48	52	50	52	50
Broom Corn.....	46	46	46	46	46
Blue Grass.....	14	14	14	14	14
Bran.....	20	20		20	20
Carrots.....					50
Castor Beans.....	46	46	46	46	46
Clover Seed.....	60	60	60	60	60
Corn, shelled.....	56	56	56	56	56
Corn, on ear.....	70	70	60	70	70
Corn Meal.....	50	48	50	48	48
Coarse Salt.....	50	50	50	50	50
Charcoal.....	22	22	22	22	22
Coke.....		40			
Coal, stone.....	80	80	70		
Cranberries.....	40				
Flax Seed.....	56	56	56	56	56
Hemp Seed.....	44	44	44	44	44
Hungarian Grass Seed.....	50	48	48	48	48
Irish Potatoes, heaping measure.....	60	60	60	60	60
Mil et.....	50	50	48	50	50
Malt.....	38	38	38	38	38
Oats.....	32	32	33	32	32
Osage Orange.....	33	33	33	33	33
Orchard Grass.....	14	14	14	14	14
Onions.....	54	57	57	57	50
Peas.....	60	60	60	60	60
Peaches, dried.....					28
Parsnips.....					44
Plastering Hair.....	8	8	8	8	8
Rye.....	56	56	56	56	56
Rutabagas.....					57
Red Top Seed.....	14	14	14	14	14
Sweet Potatoes.....	56	56	56	56	56
Timothy Seed.....	45	45	45	45	45
Turnips.....	50	55	55	55	42
Wheat.....	60	60	60	60	60

Beef and pork per barrel, net.....	200 pounds
Flour, per barrel .....	196 "
White fish and trout, per barrel.....	200 "
Salt, per barrel.....	280 "
Lime, per barrel.....	220 "
Hay, well settled, per cubic foot.....	4½ "
Corn on cob, in bin, per cubic foot.....	22 "
Corn, shelled, in bin, per cubic foot.....	45 "
Wheat, in bin, per cubic foot.....	48 "
Oats, in bin, per cubic foot....	25½ "
Potatoes, in bin, per cubic foot.....	38½ "
Sand, dry, per cubic foot... ..	95 "
Clay, compact, per cubic foot.....	135 "
Marble, per cubic foot.....	169 "
Seasoned beech wood, per cord.....	5,616 "
Seasoned hickory, per cord.....	6,960 "

Seeds required for a given number of plants, etc.:

One ounce of asparagus will produce about.....	500 plants.
One ounce of brocoli, cabbage, cauliflower, egg plant, kale, tomato, leek or pepper.....	3,000 "
One ounce of celery, endive or lettuce.....	6,000 "
One ounce of okra or spinach may be allotted for every....	100 feet of row.
One ounce of beets, onions, radish, or salsify to every.....	175 "
One ounce of carrot, parsley, parsnip, or turnip to every....	200 "
One ounce of cucumber is sufficient for.....	150 hills.
One ounce of muskmelon is sufficient for.....	100 to 125 "
One ounce of watermelon is sufficient for....	40 to 60 "
One ounce of pumpkin or squash is sufficient for.....	40 to 60 "
One quart of field pumpkin is sufficient for.....	400 to 500 "
One quart of dwarf or bush beans is sufficient for 200 feet of row or .....	300 "
One quart of pole beans is sufficient for.....	100 to 200 "
One quart of peas is sufficient for.....	100 to 200 feet of row.

Value of food for domestic animals. The figures give the number of pounds of any one substance to be equal to the quantity given of any other—the result of experiments:

	Pounds.
Good hay .....	100
Good clover hay.....	95
Rye straw.....	355
Oat straw .....	220
Potatoes.....	195
Carrots.....	280
Beets.....	346

Rutabagas.....	262
Wheat.....	43
Peas.....	44
Beans.....	46
Rye.....	49
Barley.....	51
Indian corn.....	56
Oats.....	59
Buckwheat.....	64
Oil cake.....	64

Distances for planting trees, etc.

	Feet.
Apples, standard.....	25 to 33
Apples, dwarf.....	5 to 8
Pears, standard.....	20
Pears, dwarf.....	8 to 10
Peaches, headed back.....	12
Cherries, standard.....	20
Cherries, dwarf.....	8 to 10
Plums, standard.....	15
Plums, dwarf.....	8 to 10
Quinces.....	6 to 8
Grapes.....	10 to 12
Gooseberries and currants.....	4
Raspberries.....	4
Blackberries.....	6 to 8

Contents of cisterns. The following gives the contents of circular cisterns for each foot in depth:

Diameter.	Barre's.
5 feet.....	4.66
6 feet.....	6.71
7 feet.....	9.13
8 feet.....	11.93
9 feet.....	15.10
10 feet.....	18.65

To find the value of any number of pounds of hay, less than a ton: Rule.—Multiply the price of a ton of hay, written in cents, by the given number of pounds, and divide by 2,000; the quotient will be the answer in cents, which reduce to dollars by cutting off the two right hand figures.

United States bushel and gallon. The United States bushel is



2,150.40 cubic inches; the gallon, 231 cubic inches. The dry measure gallon, or one-eighth of bushel is 268.8 cubic inches.

To find the quantity of hay in a mow:

Rule.—Multiply the length of the mow by the breadth, and that product by the height; divide by 600 for timothy and 800 for clover; the result will be tons. The remainder multiplied by  $3\frac{2}{3}$  will give the pounds.

To measure corn in the crib:

Rule.—Multiply the length, breadth and height together, in feet, to obtain the cubic feet; multiply this product by 4, and strike off the right figure, and the result will be shelled bushels, nearly.

To find the number of bushels in a box or granary:

Rule.—Multiply together the length, breadth and height, all in feet; then multiply by 4, and divide by 5, and the result is bushels.

Note. Should the dimensions of the granary not be in even feet, then multiply together length, breadth and height in inches and divide by 1728; the result will be cubic feet; then multiply by 4 and divide by 5, as in the above rule.

To find the capacity of cisterns:

Rule.—Multiply the square of the diameter by the decimal .7854, and this product by the depth of the cistern in inches; divide by 231 and the result will be gallons; then by  $31\frac{1}{2}$  for barrels.

Quantity of seed required for a given length of drill.

Asparagus ..	to 60 feet of drill.....	1 oz.
Beet .....	50.....do.....	1 "
Beans dwarf...	100.....do.....	1 qt.
Carrot .....	150.....do.....	1 oz.
Endive.....	150.....do.....	1 "
Okra .....	40.....do.....	1 "
Onion .....	100.....do.....	1 "
Onion sets....	20.....do.....	1 qt.
Parsley .....	150.....do.....	1 oz.
Parsnip .....	200.....do.....	1 "
Peas .....	100.....do.....	1 qt.
Radish.....	100.....do.....	1 oz.
Salsify .....	70....do.....	1 "
Spinach.....	100.....do.....	1 "
Turnip.....	150.....do.....	1 "

Quantity of seed required for a given number of hills.

Pole beans....	150.....hills.....	1 qt.
Corn .....	100.....do.....	1 "
Cucumbers ....	150.....do.....	2 oz.
Watermelon...	40 to 60.do.....	2 "
Muskmelon ...	75 to 100.do.....	2 "
Pumpkins.....	70 to 80..do.....	4 "
Squash.....	60 to 80..do.....	4 "

Quantity of seed per acre.

Dwarf beans in drill.....	$\frac{3}{4}$ to 1 bush.
Peas that make small vines.....	$1\frac{1}{2}$ to 3 "
Peas that make large vines.....	$1\frac{1}{4}$ to 2 "
Beets in drills....	4 lbs.
Cabbage in hills.....	$1\frac{1}{2}$ lbs.
Cabbage in bed to transplant.....	2 oz.
Carrot in drills.....	$1\frac{1}{2}$ to 2 lbs.
Muskmelon in hills.....	1 to $1\frac{1}{2}$ "
Mangle Wertzcel in drills.....	4 "
Onions for bulbs to sell green, or to trace, in drills....	6 to 8 "
Onions for dry bulbs in drills....	3 to 4 "
Onions for sets in drill.....	30 "
Onion sets in drills.....	10 bush.
Potatoes in drills, cut, depend on number of eyes.....	8 to 14 "
Radish in drills.....	5 lbs.
Parsnip. ....	$1\frac{1}{2}$ to 3 "
Spinach in drills.....	10 to 15 "
Sage in drills.....	4 to 6 "
Squash, running varieties in hills.....	2 to $2\frac{1}{2}$ lbs.
Squash, bush varieties in hills.....	3 to 4 "
Tomato in beds to transplant.....	2 oz.
Turnips in drills.....	1 to $1\frac{1}{2}$ lbs.
Red clover.....	6 to 10 "
White clover.....	4 to 6 "
Timothy .....	6 to 11 "
Red top .....	7 to 14 "
Orchard grass .....	8 to 12 "
Blue grass.....	5 to 10 "
Millet.....	18 to 25 "
Lawn grass, where a fine growth is desired.....	14 to 28 "

Table showing the number of plants or trees to the acre, at given distances.

<i>Dist. apart.</i>	<i>No. plants.</i>	<i>Dist. apart.</i>	<i>No. plants.</i>
$\frac{1}{2}$ foot .....	174,240	8 feet .....	680
1 foot .....	43,560	9 feet .....	537
$1\frac{1}{2}$ feet .....	19,360	10 feet .....	435
2 feet .....	10,890	11 feet .....	360
$2\frac{1}{2}$ feet .....	6,969	12 feet .....	302
3 feet .....	4,840	15 feet .....	193
4 feet .....	2,722	18 feet .....	134
5 feet .....	1,742	20 feet .....	108
6 feet .....	1,210	25 feet .....	69
7 feet .....	889	30 feet .....	49

### DATES OF IMPORTANT INVENTIONS AND IMPROVEMENTS.

The great inventions and improvements made in things contributing to the utility of mankind, should be remembered as forming the most instructive feature of the history of the world. They bear witness to the progress of civilization, and the spread of refining influences. Their number, variety and importance form the assurance of widely diffused conveniences among men, and humanizing influences in society; and, on the other hand, their paucity indicates a condition analogous to savage life, representing men as ignorant, indolent and barbarous. For the information of our readers we give below, in alphabetical order, the dates of the invention of, or improvement in, the most important articles with which we come in contact from time to time, or their introduction into England, and consequently into this country at a later period:

Air balloons introduced into England, and Mr. Lunardi ascended from Moorfields, September 15, 1794; Blanchard and Dr. Jeffries went from Dover to Calais, January 7, 1785.

Apricots first planted in Great Britain, 1540.

Archery introduced previous to 440.

Artichokes first planted in England, 1487.

Asparagus first produced there, 1608.

Baize manufacture first introduced at Colchester, 1608.

Beer—ale invented 1404 B. C.; ale booths set up in England, 728 A. D., and laws passed for their regulation. Beer first intro-

duced into England, 1492; in Scotland, as early as 1482. By the statute of James I, one full quart of the best beer or ale was to be sold for one penny, and two quarts of small beer for one penny.

Bells invented by Paulinus, bishop of Nola, in Campagna, about 400. The first tunable set in England were hung up in Croyland Abbey, in Lincolnshire, 960; baptised in churches, 1030.

Bible first translated in the Saxon language, 939; into the English language by Tindal and Coverdale, 1534; first translated by King's authority, 1536.

Blankets first made in England, 1340.

Books, a very large estate given for one on cosmography by King Alfred, were sold for £10 to £30 apiece, about 1400.

Bows and arrows introduced, 1066.

Bread first made with yeast, about 1650. In the year 1754, the quarter loaf was sold for 4d.; three years afterwards, in the year 1757, it rose to 10d., and in March, 1800, to 1s. 5d., when new bread was forbidden, under the penalty of 5s. per loaf, if the baker sold it until 24 hours old.

Bridge, the first stone one in England, at Bow, near Stratford, 1087.

Buckles invented about 1680.

Calicoes first made in Lancashire in 1772.

Candles, tallow, so great a luxury, that splinters of wood were used for lights, first began to be used in 1290. No idea of wax candles, 1300.

Cannon invented, 1330; first used by the English, 1346; first used in England, 1445; first made of iron in England, 1547; of brass, 1635.

Cauliflowers first planted in England, 1703.

Celery first introduced in 1704.

Chairs, sedan, first used in London, 1634.

Cherry trees first planted in Britain, 100 years B. C., brought from Flanders and planted in Kent, 1540.

Chimneys introduced into buildings in England, 1200, only in the kitchen or large hall, smoky, where the family sat around a large stove, the funnel of which passed through the ceiling, 1300.

China made in England, at Chelsea, in 1752; at Bow in 1758, and in several parts of England in 1760; by Mr. Wedgwood, 1762.

Chocolate introduced into Europe, from Mexico, in 1520.

Cloth, coarse woolen, introduced in 1191; first made at Kendal, 1490; medleys first made, 1614.

Coaches first used in England, 1580; an act passed to prevent men riding in coaches, as effeminate, in 1601; began to be common in London, 1605.

Coals discovered near Newcastle, 1234; first dug at Newcastle by a charter granted the town by Henry III; first used, 1280; dyers, brewers, etc., in the reign of Edward I, began to use sea coal for fire in 1350, and he published a proclamation against it, 1398, as a public nuisance; imported from Newcastle to London in 1350; in general use in London, 1400.

Coffee first brought into Great Britain, 1641; coffee trees were conveyed from Mocha to Holland, 1616, and carried to the West Indies in the year 1726; first cultivated at Surinam by the Dutch, 1718; its culture encouraged in the plantation, 1732.

Coin first made round in England, 1101; silver half pence and farthings were coined in the reign of John, and pence the largest current coin; gold first coined in England, 1087; copper money used only in Scotland and Ireland, 1399; gold coined in England, 1345; groats and half groats the largest silver coin in England, 1531; in 1347, a pound of silver was coined into 22 shillings, and in 1352, a pound was coined into 25 shillings; in 1414, it was increased to 30 shillings, and in 1500, a pound of silver was coined into 40 shillings. In 1530, they were extended to 62, which is the same now; the money in Scotland, till now the same as in England, began to be debased, 1354; gold first coined in Venice, 1346; shillings first coined in England, 1068; crowns and half-crowns first coined, 1551; copper money first introduced into France, by Henry III, in 1580; the first legal copper coin introduced, which put an end to private leaden tokens, universally practiced, especially in London, 1609; copper money introduced into England by James I in 1620; milling coin was introduced, 1662; half-pence and farthings first coined by government, August 16, 1672; guineas were first coined, 1673; silver coinage, 1696; broad pieces of gold called in by government and coined into guineas, 1732; five shillings and three penny pieces in gold were issued in 1716 and 1761. Sovereigns were first coined in 1820.

Cow-pox, inoculation by, as a security against small-pox, introduced by Dr. Jenner, 1800.



Creed, Lord's Prayer, and Ten Commandments, first translated into the Saxon tongue, 746.

Currants first planted in England, 1533.

Cider, called wine, made in 1284.

Distaff spinning first introduced, 1505.

England, so named by Egbert, 829; first divided into counties, tithings, and hundreds, 890; the first geographical division of it, 1520.

Fairs and markets first instituted in England by Alfred about 886. The first fairs took their rise from wakes, when the number of people then assembled brought together a variety of trades annually on these days. From these holidays they were called *feriae* or fairs. Fans, muffs, masks, and false hair, brought from France, 1572.

Figures in arithmetic introduced, 1454. Fruits and flowers, sundry sorts before unknown, introduced in the reign of Henry VII and VIII, from about 1500 to 1578, as the musk and damask roses and tulips, several sorts of plum trees and currant plants.

Gardening introduced from the Netherlands from whence vegetables were imported till 1509; muskmelons and apricots cultivated in England; the pale gooseberry, with salads, garden roots, cabbages, etc., brought from Flanders, and hops from Artoris, 1520; the damask rose brought here by Dr. Dineacre, physician to Henry VIII; pippins brought to England by Leonard Muscal, of Plumstead, in Sussex, 1525; currants or Corinthian grapes, first planted in England, 1555, brought from the Isle of Zant, belonging to Venice; the musk rose and several sorts of plums from Italy, by Lord Cromwell; apricots brought here by Henry VIII's gardener, tamarind plant from Germany by Archbishop Grindal; and at about Norwich the Flemmings first planted flowers unknown in England, as gilly flowers, carnations, the Province rose, etc., 1567; wood originally from Thoulouse in France; tulip roots first brought into England from Vienna, 1578; also beans, peas, salads, now, in common use, 1660.

Gas, use of, in London, for lighting streets, 1814.

Glass introduced by Benedict, a monk, 674; glass windows began to be used in private houses, 1180; first made in England into bottles and vessels, 1557; first plate glass for looking-glasses and coach

windows made at Lambeth, 1673; in Lancashire, 1773; window glass first made in England, 1557.

Grapes brought to England, and planted first in 1552.

Gunpowder first made in England, 1418.

Hats first made in London, 1510.

Hemp and flax first planted in Great Britain, 1533.

Heraldry had its use, 1100.

Hops first used in malt liquors in Great Britain, 1525.

Horse shoes introduced into general use in 300; first made of iron, 481.

Inoculation first tried on criminals, 1721.

Iron first cast in England, 1544.

Knives first made in England, 1563.

Lamp for preventing explosion by fire damp in coal mines, invented by Sir H. Davy, in 1815.

Lanterns invented by King Alfred, 890.

Leaden pipes for conveying water invented, 1236.

Life boats invented, 1802.

Linen first made in 1253. Table linen very scarce in England 1386.

Lithographic printing brought into Great Britain, 1801.

Magic lantern invented by Roger Bacon, a monk, 1252.

Magnifying glasses invented by Roger Bacon, 1260.

Mulberry trees first planted in England in 1709.

Muslin first manufactured in Great Britain in 1781.

Navigable canal, the first in England in 1134.

Needles first made in England, 1545.

Newspaper, first published in England, and was entitled the English Mercury. A private newspaper, called the Weekly Courant, was printed in 1622. After the revolution, the first daily paper was called the Orange Intelligence.

New style in the computation of time introduced into England, 1752.

Paper, the manufacture of, introduced at Dartford, in Kent, 1588; scarcely any brown paper made till 1690; white paper first made in 1690.

Parish registers, first introduced by Lord Cromwell's order, 1538.

Park, the first in England, made by Henry I, at Woodstock, 1123.

Penny post set up in London and suburbs, by one Murray, an upholsterer, in 1681.

Pins were first used in England by Catherine Howard, queen of Henry VIII.

Port holes in ships of war first introduced in 1545.

Post, regular, established between London and most towns of England, Ireland, Scotland, etc., 1635.

Posthouses and stages established, 1483.

Postoffices first established in England in 1581.

Potatoes first brought to England from America, by Hawkins, in 1653; introduced into Ireland by Sir Walter Raleigh in 1586.

Printing introduced by William Caxton, a mercer of London, 1471, who had a press in Westminster Abbey till 1494.

Roads in England first repaired by act of parliament, 1524.

Sail cloth first made in England, 1590.

Saltpetre first made in England, 1625.

Scenes first introduced into theaters, 1533.

Shillings first coined in England, 1505.

Ship, the first double decked one built in England was of 1,000 tons burden, by order of Henry VII, 1509; it was called the great Harry, and cost £14,000; before this 24-gun ships were the largest, and these had no portholes, the guns being on the upper decks only.

Shoes of the present fashion first worn in 1633.

Side saddles first used, 1380.

Silk first manufactured in England, 1604; first worn by the English clergy, 1534; broad silk manufactured from raw silk, introduced in 1620; Dombé's famous silk throwing machines erected at Derby, 1713.

Soap first made at London and Bristol in 1524.

Steamboat established between Norwich and Yarmouth, November, 1813; steamboat capable of conveying 300 persons, commenced its passage between Limehouse and Gravesend, February, 1735.

Stirrups first used in the sixth century.

Stereotype printing invented by William Ged, a goldsmith of Edinburg, 1735.

Stone building introduced in 674.

Sunday schools established in Yorkshire 1784; became general in England and Scotland in 1789.

Tea, coffee and chocolate first mentioned in the statute books, 1660.

Thread made at Paisley, in Scotland, 1722.

Tiles first used in 1246.

Tobacco brought into Great Britain, 1583.

Towers, high, first erected to churches in 1000.

Watches first brought from Germany, 1577.

Water conveyed to London by leaden pipes, 1257.

## FOURTH ANNUAL INDUSTRIAL CONVENTION.

*Held at Oshkosh, March, 1877.*

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The sessions each day and evening were very interesting. The attendance was large and all seemed well entertained.

These conventions are becoming more and more important, and probably do more actual good than the fall meetings or fairs. It is hoped that hereafter all persons engaged in the active business of life, in any of the industrial pursuits, will be present and take part in the exercises.

The following are the papers read before the convention of 1877.

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## FARMING IN GERMANY COMPARED WITH FARMING IN AMERICA.

BY F. WEYERHORST, OF BLACK WOLF.

My extensive travels in Europe, from the shore of the Baltic to the southern dominion of Russia, on the Black Sea, through those wonderful productive countries, Hungary, Germany, Belgium and the Lombardy, all of these wheat growing countries for centuries, gave me opportunity to see and enquire of the *modus operandi* going on in producing such fine qualities and large quantities of this important serial, and keep up the soil in so high a state of cultivation.

The farmers of these countries are divided into three distinct classes—the aristocratic, the gentleman farmer, and the common. The common farmers live in villages, surrounded by gardens and orchards, which are fenced in with live hedges. Their plow land



lays outside this in pieces ranging from a quarter of an acre to three and four acres. A farmer who owns twenty acres of land has to hunt them up in fifteen to sixteen pieces all around the village. Very seldom does he own as much in one lot. If a farmer has from ten to twelve acres under cultivation, they work it with one ox; even in many instances I saw a span of fine cows hitched to the plow or drag, which makes a splendid team, besides furnishing milk and butter. They are harnessed nearly like horses, with a little wooden yoke against the forehead, close to the horns. On both sides of the yoke are iron hooks, where the tucks are fastened to. If they possess twenty acres or more, they use horses.

Those small common farmers live very economical, mostly on milk, potatoes, vegetables, and cheese made of skimmed milk. Meat is not an every day food for them. They raise considerable flax, which the women folks spin in winter and manufacture into cloth, which is used for domestic purposes. They raise enough oil seed for light and culinary use.

In luxuries he seldom indulges; he is industrious, and a good farmer; but he cannot keep stock enough to bring his land to the highest. This class of poor farmers are assisted in their labor by their wives and daughters, as in those pictures that we usually see relating to farmers' life in Germany, can only be traced to this class. The common farmer who is better off, and owns from forty to a hundred acres, is an independent man, makes money, lives well, and takes it very easy; he is in better circumstances than the most farmers in this country who own three hundred acres.

The gentlemen farmers own from one hundred to four hundred acres all in one piece, the farm buildings on it as it is in this country.

Here begins a different kind of farming; all is systematically regulated.

The most of these farmers are highly educated. They have a good judgment, possess great energy, have been through colleges and universities. They studied the laws of nature, and have some knowledge of the chemical processes that go on in the soil in relation to growth. They have listened with the greatest attention to Prof. Liebig's lectures to benefit by them in the future. And they did so, as is shown by the luxurious crops. Indeed it seems as though the spirit of life was floating over the waving grain on their

farms. His fine herd of cattle and the large wooly flock is guaranty that his pile of manure is enough for all emergencies.

Step into his barnyard and there is a large reservoir in which flows all the liquid of the yard and stables. A large sprinkler on wheels stands near to receive the valuable fertilizer for distribution over grass and clover fields.

On entering his cow stables, how clean, roomy and comfortable, with the best of ventilation. This department is exclusively under the control of women, who do the milking and feeding. They feel exceeding proud of the sleek appearance and great yield of milk from their darling kine. Through the winter they get two warm meals a day, consisting of clover, hay chaff, carrots, beets and meal, all steamed together, which make excellent fodder.

The department of swine is very important to those farmers, not on account of fattening, but on raising young ones till they are three or four months old. They must have that age in March or April, then the drovers come around and buy them up. In these months they hold fairs all over the country where they are sold. The common farmers seldom raise pigs, they buy them from the droves and fatten them.

Corn is not raised in Germany because the summers are not warm enough. For fattening, they sow large fields of peas and house beans together. The latter has a sturdy stalk which supports the vine of the peas, and both kinds ground together make an excellent fodder for fattening; and for working horses it is better than corn. The cultivation is as follows: During the winter they haul the manure on the field and spread it. As early as possible in the spring, they sow beans and peas together broadcast over the manured land and plow them under five or six inches.

After the crop is taken off, the land is replowed, and then it is in the best condition for winter wheat.

Besides barnyard manure, they make large composition heaps from turf, forest leaves, lime, mould, ashes, and a quantity of salt, all mixed together. After it is worked over twice, in six months it is ready for use. Heavy clay soil is plowed from twelve to fifteen inches deep, with three horses, for mangle wortzel, carrots and sugar-beets. They have an extra plow drawn by two yoke of oxen which deepens the furrows to eighteen inches. They say horses could not stand, for a long time, such heavy work.

Sufficient under draining, care of manure, plenty of clover, and rotation in crops, keep the soil in such condition that they rely on from thirty to forty bushels of wheat per acre. Near the Rhine, West Phalian on Belgium, they go immediately after harvest over the stubble field with a heavy drag, and rake the stubble in heaps and burn them. This destroys the harbinger of so many insects destructive to the wheat crop. In reference to deep plowing, they have the opinion that wheat poorly filled, and even the blight, is partly the result of shallow plowing.

The root of the plant ought to have a chance to go down where is always moisture for sustenance. But all this farming requires a great deal of labor. Happy for the farmer, and unhappy for the laborer, that workingmen are abundant. In those counties, with low wages and poor board, the laborer toils on, year after year, without saving a dollar for himself, to keep up a paradise for the rich owner of the soil. Now let us bring in account the high price of grain, the monstrous prices of cattle, hogs and horses, even butter, cheese and eggs are twice as high as here. No wonder if you come in his mansion, and see the luxury and refinement. The neatest paintings adorn his parlor walls, alabaster statues his mantelpiece, and his library a true treasury of volumes, containing our classics and philosophers. The aristocratic class of farmers, particularly in the northern part of Germany, Roumania and Mecklenberg, own large tracts of land, and even whole villages. These estates are under the control of directors and overseers. The owner lives in a palatial house, on the farm or in the city. Their overseers manage the business with zeal and promptness. They raise very good crops on account of keeping large flocks of fine merino sheep. They are very careful in sheltering and attending them. In latter years they found a kind of herb, with sweet scented flowers (the Lupineen), which, made into hay, is the best food for sheep through the winter.

How different is carried on the most farming in this country! We go over a large piece of land with the least labor possible; our new soil brought abundant crops without great effort. We have hardly thought of rotation. Wheat after wheat crops for twenty years in succession, no drainage, and very little manure, on account of burning the straw; blessed is the farmer who has a creek near his barnyard, into which the superfluid nuisance is drained. Is it not a pity that this state of doings cannot go on forever?

In the spring of 1848, I had a piece of land that was roughly plowed in the fall previous, dotted with stumps and stones. I made me a heavy, three-cornered drag with eleven teeth; besides the plow, these were all the farm implements in my possession. Took my yoke of oxen and began operation, smoothing the rough ground down a little, then sowed one bushel and a half of wheat to the acre, dragged and cross-dragged it. The next fall it brought thirty-eight bushels per acre, and so on for fourteen years in succession. It never brought less than thirty bushels, and the only farm implement was still that heavy three-cornered drag. This shows how easy and cheap it was to raise wheat in that time; even labor was easy to get, and at reasonable terms. But how different it is now to raise a profitable crop of wheat! Our soil partly exhausted, needs heavy manuring for corn, and afterward put in wheat. We then can expect reasonably a good crop. But to get manure enough we must keep stock; to keep stock we must have plenty of fodder; and the recourses are large clover fields and fodder corn. Another item is to keep the land clean from weeds, which can partly be done by shallow plowing right after harvest. The hot sun in August and September benefits the soil after it is plowed, and destroys the foul germs that would grow up between the stubbles, and later in the fall it makes the deep plowing easier.

To compete successfully with European farming can hardly be done on account of climate, cheap labor, and high prices of grain. They sow early in March, and harvest the last days of August. This makes the season two months longer in that mild climate for the growing crops, quite a difference compared with our hot summers.

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## HOW SHALL WE MAKE BEAUTIFUL HOMES CHEAP?

BY MRS. C. H. ROOT, RIPON.

The greater part of our population are waiting till they can afford to have pleasant homes, forgetting that they can at no time afford to have any other. We take the color of our daily surroundings, and are happier, more amiable, stronger to labor and firmer to endure, when those surroundings are pleasing and in good taste. To



possess these important qualities they need not be expensive. True beauty is cheaper than we think; the first charm of a home, within and without, is thorough neatness, and this is the result of habit, not outlay. It is cheaper than filth. Paint the house if you can, if not, whitewash; but in any case let it be in thorough repair; let there be no loose shingles or dangling clapboards, or gates hanging by a broken hinge. These hints favor thought as well as taste; let the house be sufficiently shaded, this will pay in comfort, wear of furniture, and lack of flies. If you cannot afford green blinds, you can always afford a green tree or two, that costs nothing but labor and patience, and will shelter you from the sun in summer and the wind in winter. Plant vines of some kind about your premises; they are indispensable to grace; they show that nature takes kindly to your home, and has thrown her arm around it; you need not resort to costly climbers; woodbine is very pretty and may be had for the gathering, and grape and hop vines may be so trained as to combine both beauty and profit. Let your turf be firm and smooth as velvet, and enforce the death penalty upon weeds with an unsparing hand. No man, rich or poor, can afford to raise weeds; they choose the richest spots, where flowers or vegetables or fruit might grow, and send abroad their seeds as missionaries of evil into every nook and corner. Ill kept places always have their vegetable five points, where sin and misery are mimicked in pigweed, burdock and nettles. A very few flowers will suffice; a monthly rose in the window, a morning glory over the doorway, and bright border between your kitchen garden and the street; they add to the picture just those touches of color that make it pleasant to the eye. With half a dozen kinds you can almost always have something in bloom. But flowers are gross feeders, and if you have no domestic animals, you fancy, perhaps, that you have no dressing; you were never more mistaken.

Every human dwelling is a center of fertilizing agents, mostly wasted as times go, rich enough to make the whole plat around it blossom like the rose. The suds from the laundry is a store of liquid wealth; never waste a drop of it in drains or sewers. It is a floating currency, promising to pay roundly in grass, fruit and vegetables. Invest it in your home banks which never suspended payment; these grassy slopes are greenbacks, whose issue is as good as gold. Those old bones that deform the premises, if buried



beneath the grape vine will be health to you and all your friends. Old boots and shoes, those most unsightly things, are the favorite food of the raspberry and all its palatable kin. Tainted brine, if such unhappily is yours, is a treasure for the plum tree and the asparagus bed. Every household should have its compost bed, be it only an old packing box, where woolen rags, bits of paper, apple parings, refuse of vegetables, slops from the kitchen, chips and sawdust are storing up the elements of a glorious growth. Let not yours be one of the homes where all those bright possibilities arrive only at burning instead of beauty. We have named but a part of the fertilizers of every household. Generally speaking, whatever is offensive to sight or smell is urging an appeal to our revolted tastes — "bury me and I will do you good."

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## THE DAIRY.

BY HIRAM SMITH, SHEBOYGAN FALLS,

President of the Northwestern Dairymen Association.

In looking over the publications that have been issued from the several dairy associations, for the past few years, it will be observed that the leading idea has been to secure greater perfection in the products, a larger yield, more economy in manufacturing, the proper construction of curing rooms, and the latest discovered scientific tests that aid in all departments of the dairy interest. However interesting and instructive this may be to advanced dairymen, it does not furnish to the new beginner or those contemplating engaging in that enterprise, that minute and elementary information which they most need and desire. At the hazard of becoming amenable to the charge of telling what most cheese factorymen already know, I will endeavor to give my experience and observation in regard to starting cheese factories in localities where a large investment would not pay. A few years ago it was thought necessary to have four or five hundred cows, a flowing spring at some central point, and the outlay of five or six thousand dollars — three formidable obstacles to starting a factory in any country — neither of which are essential, for it will pay if there are 150 cows.

A good well and windmill answer every purpose of a flowing spring, and seven or eight hundred dollars are ample means to invest for the first few years. Almost any cross-roads, surrounded by good farms, is as good as any other place. There is just as much land accessible around one spot as there is around any other spot; and, as a rule, farmers will not, for any great length of time, haul their milk to exceed two miles, and some prefer to go but one. The rapid spread of cheese making in Sheboygan county is attributed to the cheap manner of erecting and furnishing factories. A building sixteen by twenty feet, two stories high, sealed outside and in (with straw board paper between sidings, or grout filling) makes the best curing room that science or experiment has yet discovered. A vat room, twelve by eighteen feet, adjoining, is ample room for three hundred cows. A two hundred cow vat, set in a water vat made with wooden sides and ends, with galvanized sheet iron nailed on for bottom, the whole set on a brick arch, with fireplace at one end and a large pipe to carry off the smoke at the other, makes the very best vat now in use, and costs less than \$100. A gang press, with twelve hoops, costs about \$140, that will press the curd from two hundred cows into cheddar shape cheese, without the symptoms of a failure in the whole season. Weigh-can, weigh-scales, and other implements, will cost about \$50. You will readily perceive that the whole expense for a factory of two hundred cows (which is all that can be obtained the first year in almost any locality) will not exceed \$500. It will be much easier to start ten such factories in a county than one four thousand dollar factory. The difficulty, in starting a factory of the latter description, is to find a man in a farming community with the requisite business capacity to manage it, with the capital to invest, and confidence in the enterprise — all three of which should be combined in one person to insure success. Such factories are sometimes started with associated capital, which implies associated management that often proves cumbersome and inefficient, and occasionally results in "unpleasantness." When small, cheap factories have been put in operation, experiments have, in a large majority of cases proved eminently satisfactory, and it soon becomes contagious, and factories spring up in many localities that would otherwise be deprived for years of the benefits of dairying if they had to wait for the erection of large factories.

There is another question of equal importance, and intimately connected with cheap cheese factories, and that is, does dairy farming pay better than other branches of agriculture? It would not become me to answer the question directly one way or the other, but simply state my experience, which I have no doubt corresponds with the experience of other dairymen; that a flock of well kept cows produce, in cheese, butter, calves or pork (all products of the dairy) an average of fifty dollars per cow, annually; that an eighty acre farm, in passable condition, will support a dairy of twenty cows, or one hundred and sixty acres, forty cows, the receipts from which would be two thousand dollars. I would ask grain farmers, who are exhausting their soil by continuous cropping, if their receipts, take one year with another, will average much over one-half that amount? If so, the profits of grain raising must have greatly improved during the last twelve years. It is an oft-repeated tale, but as I am in the elementary business, it may not be out of place to give some suggestions in regard to the process of manufacturing cheese. It may be assumed as a settled fact that milk will not be delivered to cheese factories but once a day, except by those having large amounts and who live close to the factory. Where milk is kept at the farm over night, it should be aerated and cooled in ordinary weather down to 70° or 75°, and in very warm weather to 60° or 65°. Each patron should have an aerater and thermometer, costing but fifty cents each, which if properly used through the season will add a net profit to each cow of not less than one dollar, and may save three times that amount, which the poor man cannot afford to lose, and the rich man ought not to be foolish enough to do so.

When such milk as above described is all delivered in the vat, sufficient heat should be slowly applied to raise the temperature to 82°, when coloring and rennet should be added sufficient to coagulate in one hour; then with gang knife cut lengthwise, letting it stand ten minutes, or until the whey separates sufficient to nearly cover the top of the curd. Then cut crosswise and allwise, until the curd is about the size of beechnuts. Then apply more heat so as very gradually to raise the temperature to 100°, stirring the meantime to prevent packing and secure an even scald. It may be kept in this condition one hour, if no acid appears. As soon as the acid begins to appear, two-thirds of the whey may be drawn off. The precise amount of acid is determined by placing some of the curd to a hot

iron; if it does not stick, there is not enough acid; if it sticks so that hundreds of fine fibers will draw or spin out half an inch or more from the iron, there is too much acid; but when it shows a white bluff, an inclination to stick, the warm water under the vat should all be removed, and cold water immediately supplied in place of the warm, which checks the further development of acid. When cooled to 80° the remaining whey can be drawn off and the curd worked to the raised end of the vat and allowed to drain, and worked up fine and lively, and salted at the rate of 2½ pounds of fine salt to the 100 pounds of curd, and immediately put to press; a light pressure at first, increasing later on. After one or two hours' pressing the followers should be removed and the bandage properly adjusted, and the pressure resumed until the next morning, when it may be removed to the curing room. If the curing room has been properly constructed, and kept at an even temperature day and night of about 70 or 75°, this cheese will develop into a mild, rich, mellow, close-made, nutty-flavored cheese, fit to take the medal at the Centennial, or the sweepstake premium at the state fair. Or if this same cheese should be put in a cold open building, it may sour before it commences to cure, and leak out all the richness in it, and become more effectually skimmed than could be done with a skimmer applied to the milk. If it should escape the calamity of leaking, it would be a dead, clammy, tough, flavorless mass, without richness, unfit for the human stomach, and unsuited for any market. Or if the same cheese, when taken from the press, had been put into a room that furnished no protection against the excessive heat of summer, it would become rank, sharp of flavor, odoriferous, and no cheese buyer would want it, and it would have to be sent to some commission house, and when the proceeds came, the cheese maker would think, and perhaps report, that the commission man had cheated him. I do not suppose that all commission men are paragons of excellence, neither can they perform a miracle, and get the best price for the poorest cheese. I mention these well known facts that new beginners may avoid the losses that befell those earlier in the field.

With regard to the question asked in the topic assigned me in the programme, How does Northeastern Wisconsin compare with the Northwest for Dairying Purposes? In the absence of any actual comparative tests, some of the comparisons will be only conjectural,



but there are some natural advantages pertaining to eastern and northeastern Wisconsin, that do not adhere to any other locality in the northwest. The cooling breezes from Lake Michigan, like the "railroad passes" of members of the legislature, are not transferable. This cool atmosphere from the lake greatly modifies the temperature in its vicinity, which embraces all the eastern portion of Wisconsin. It not only makes it less difficult to preserve, in good condition, dairy products after they are made, but it actually provides better material to begin with. This portion of the state was originally a timbered country, and each farm has its wood lot, furnishing a shade for the herds. This, in connection with the lake breeze, adds to the comfort of the cow, keeping her quiet, contented and happy. Under these circumstances the milk must be in a healthier condition when drawn from the cow, than it is in localities where there is no cool breeze and but little shade to relieve them from the scorching rays of the sun, rendering them feverish, restless and overcome with the heat, which is known to affect cows injuriously, both in regard to the quantity and quality of the milk. There are also material advantages to the eastern portion of Wisconsin in the matter of freights. Lake Michigan is a natural anti-monopolist. No combination of railway companies can raise the price of freight above boat rates. These companies may swear at the "Potter law," and combine to raise the freight in the interior, but they waste their breath swearing at the lake, and a combination would leave them with empty cars. The regular rate from the eastern portion of the state on cheese last year was 36 cents per 100 pounds, to New York, and from the vicinity of Madison it was 65 cents per 100 pounds; a difference of over \$5 per ton, or \$50 per car load. Sheboygan county ships annually one hundred car loads of cheese, making a saving in freight of \$5,000 annually. There are not less than twelve counties in the eastern portion of the state, that if they were as much devoted to the dairy interest as Sheboygan county, would save annually, in freight alone, on cheese, in the aggregate, \$60,000. These natural advantages pertaining to the eastern and northeastern portion of Wisconsin are not likely ever to be disturbed. It is very satisfactory to possess the advantages alluded to, yet it by no means proves that dairy farming may not be profitably and successfully conducted in almost any locality in Wisconsin. Many of the best cheese and butter factories are scattered widely through the state.



Wherever a good supply of mild, rich, sweet flavored cheese are made, there is no locality so far back that a cheese buyer can not find them, for they are as keen scented after such cheese as a life insurance agent is to dispose of a policy. The demand for good cheese is constantly increasing, both at home and abroad, and this increased demand can only be supplied in the territory known as the northwest. Through the eastern states there is an actual deficiency in their usual supply. Millions of money are now waiting to invest in cheese, at higher prices in gold than at any time since the war, if the cheese could be obtained. The present condition and prospects for the future give ample security that the dairy enterprise in the northwest will increase and flourish.

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## HARD TIMES AND HOW TO MEET THEM.

BY JOHN HICKS, OF THE OSHKOSH NORTHWESTERN.

“He gave it for his opinion that whoever could make two ears of corn or two blades of grass grow where only one grew before, would deserve better of mankind, and do more essential service to his country than the whole race of politicians put together.”—*Swift*.

Many years ago, an American ship was sent out upon the Atlantic, by direction of Lieutenant Maury, for the purpose of taking soundings in the deeper part of the ocean. The instrument used was a heavy cannon ball, attached to the end of a stout cord. On the under side of the cannon ball was fastened a small quill, and on one occasion, after taking a deep sea sounding, at a depth of more than a mile, the quill was found to be filled with mud, showing that it had struck bottom. This mud was carefully dried, when it crumbled into a fine dust, finer than flour. When the voyage was completed, this almost impalpable dust was submitted to the examination of Ehrenberg, the famous microscopist, and when placed under his powerful lenses, that insignificant dust which the slightest breath would scatter to the four winds of heaven, was found to be made up of tiny shells and minute animal organizations. Thus it is in this world of ours. If we carefully study the ordinary events of every day life, the common place occurrences which fall under

our daily observation, we shall discover that this is a world of cause and effect, and that good and evil are the legitimate products of certain anterior circumstances, whose existence some one is responsible for. Beginning with the individual, by a natural synthesis we derive a reasonable understanding of the natural laws which govern communities and nations. We are now passing through one of the most serious periods of business depression ever known in this or any other country. The evidences of it may be seen upon every side. Scarcely a newspaper we read but has its chronicle of failures and suspensions, and the business of the bankrupt courts is almost the only one that can be pronounced thriving. In Chicago alone, during the month of January, the number of failures reached nearly a hundred, with an aggregate indebtedness of about \$2,000,000. In Wisconsin, during the year 1876, there were 209 failures, with liabilities amounting to \$4,307,314, which figures show that in the whole United States, during the year 1876, the proportion of failures to the number of business establishments was as 1 to 60; 55,000 laborers are said to be out of employment in New York city. Such a general reign of "hard times" has never been known before, and by comparison, the panics of 1837, 1857 and 1861 dwindle into insignificance. Since the failure of Jay Cook & Co., in September, 1873, a gradual depression in values has been in progress, following closely upon the decline in the premium on gold. A man who was worth \$25,000 in 1873, found himself shrink five or ten per cent. in 1874, and if he was in any kind of business involving certain classes of goods, like iron or hardware, he considered himself fortunate if he was not bankrupt in 1875. Prices and values have gradually lowered, and no kind of business returns the same profit that it did a few years since. The price of labor depreciates in close sympathy with every other marketable commodity, thus affecting very seriously the laborer and the mechanic. If we can imagine a community, placed upon an island, entirely isolated from the rest of the world, to use an old illustration, which gradually finds its values so changed that all of its five dollar notes are worth only \$3.00, its ten dollar notes only \$6.00, and its dollars reduced in value to 60 cents, we can see at once the startling changes which have been produced in the past four years. The bottom has evidently fallen out, the foundation has been unsettled, and disorder, confusion and chaos have been the result. All class-

es have been affected. The farmer, the mechanic, the merchant, the butcher, the barber, the candlestick maker, all have had to feel the pinching influence of the great panic. There is a general feeling of depression in all ranks of society, which amounts almost to a settled melancholy. The outlook, we are told, is decidedly gloomy, as the future offers very slight promise of better times. It seems that the hour has not yet come when the dark shadow is to be lifted.

At this period, what is best to be done? It is easy enough to theorize, and argue that we need legislation or a change in the political management of the country, or that the rate of interest should be lowered, or that the national banks should be abolished, or the tariff laws repealed. The demagogues will tell us that it is all owing to bad political management, or that the legislation of the country is in bad hands, or that the rich have things in their own control, and that they are determined to crush out the poor. We are generally inclined to attribute our difficulties and embarrassments to a source as far as possible distant from ourselves. True, it is not within the power of any of us to change public affairs so as to make general good times, or to bring about that happy era of prosperity for which we are all looking; but it is the duty of every one, whatever may be his calling or occupation, so to shape his affairs as to meet the present crisis successfully. Instead of finding the whole difficulty in the hard times, perhaps a closer scrutiny will reveal the fact that a portion of our hardships and a certain percentage of our ill luck may rightfully be charged up to our own negligence, or our own lack of care and foresight. The ordinary events of our own life, if submitted to careful examination, may afford us a study from which much good may be learned, and some of the causes of our tribulations may be found nearer our home than we think. Hawthorne tells a story of a young man of whom, in his early youth, a fortune-teller predicted three great events. These three events were to result in wealth, honor and fame for the young man, and as he reached manhood his anxiety knew no bounds. As soon as he was twenty-one, he left home to seek his fortune and to meet the triple destiny which was in store for him. Up and down he traveled, visited Europe, Asia and Africa, and all over the known world he pursued his phantom. Years rolled on, and finally a man, bent with years and suffering, disappointed and hopeless,

returned to that New England home which he had left in the full flush of early manhood. He came to die, but no sooner was he safely ensconced beneath the paternal roof than the three great events at once took place, and the wealth, dignity and fortune, for which he had vainly searched, were poured upon him.

We have had panics and financial troubles before. We are told that A. T. Stewart passed through all the great business crises in the early part of his career not only successfully, but so profitably that he actually made larger gains during such trying periods than in the more peaceful and quiet times of general prosperity. Within the scope of our own observation, we see instances even in the present epoch, of business establishments that are steadily gaining in strength and standing, and whose prosperous career seems to have met with no check. You can any of you point to men and firms who have lost but little of their business, and whose net earnings are as large, or nearly as large, as they were four or five years ago. They are the exception, it is true, but that there are such cases goes to prove that certain living principles exist which govern matters of this kind. To discover these principles is well worth the attention of the wisest.

The present depression owes its origin to the disordered condition of the country growing out of the late war. In 1865, prices were high, money was plentiful, capitalists were seeking investments, and for six or seven years we had "good times" all over the northern states. Railroads were built, factories started, cities sprung up with astonishing rapidity, the price of real estate advanced, and everything indicated a high degree of prosperity. But it was the delirium of intoxication, and since 1873, we have been undergoing the "cupping process," which will undoubtedly cure the fever, even if it threaten the life of the patient. Since those quaking September days of 1873, the temperature of the financial atmosphere has been gradually lowering, until it has frozen out a large proportion of the tenderest and some of the toughest plants. In the past four years the hard times have increased upon us gradually, so gradually that each year we have sighed for the prosperity of the preceding one. This month we tearfully compare with the last month, and shudder when we contemplate the future.

A proper preparation for the different stages of this disastrous period will enable us to meet it with philosophic heroism, if not



with a certain degree of pecuniary success. In every business, and in every business transaction, there is always or should be a certain margin of profit. The mechanic sells his skill and labor for wages, the farmer trades his wheat and the products of his soil for pay, and the merchant exchanges his goods for that which furnishes him a living. All expect to receive a little more for what they have to sell than the same commodity cost them. To keep this margin of profit well defined and of sufficient magnitude is the great secret of success in business, whether times are good or bad. To understand one's business, and properly gauge it during the trying times of a panic, so that this margin is always maintained at its proper point, is to ride through all financial difficulties with the success of a Stewart or a Girard. If a mechanic finds that the cost of living is \$600 a year, and his wages amount to but \$625, it needs but little discernment to see that he is not in the path to prosperity. If I am selling cotton goods, and I find myself with a large stock when cottons are advancing and sales are lively, I am on good terms with my banker. But if the market turns and my stock is steadily depreciating with a prospect of reaching a figure much lower than I paid for my goods, then times are very hard for me, whatever may be the condition of business generally. If it cost a wagon-maker \$45 to make a wagon, and he finds a ready sale for all he can turn out at \$60 or \$65, times are good, but if wagons are slow to sell at \$50, he finds himself in a decided panic. It is obvious that to meet the emergency properly, the proportion between the cost and the selling price must be maintained at all hazards. If a farmer this year raises 2,500 bushels of wheat, where the ordinary crop has been but 1,200 or 1,500 bushels, without materially increasing his expense, he can better take 90 cents per bushel than he could \$1.25 last year, with half a crop. The proper proportion between the cost and the selling price can generally be reached by reducing the cost, and, to do this, all financial depressions will assist us. In 1872, a suit of clothes was worth \$35, and a pair of boots, \$12. The same articles can now be purchased at \$27, and \$9. But it is not improbable that the tailor and the shoemaker will each of them realize as large a net income this year as in 1872. If their gross receipts have been reduced, the expenses of manufacturing have also been greatly curtailed. Rents, labor, and the cost of living have all suffered a corresponding reduction. But to carry it fur-



ther, it may be said that the employes of the tailor and the shoemaker have suffered by the shrinkage. Not necessarily, for they have the advantage of the reduction in all of their expenses in the same proportion. In times of great prosperity or depression in business, all commodities are affected very similarly in price, and all branches of trade reap the advantage or disadvantage in a corresponding degree.

It is this adapting one's self to the exigencies of the case that makes all the difference in men's success. I went to a livery stable last summer to hire a horse and carriage, and was told that the price would be \$4.00. "But," said I, "I have had a rig from one of your competitors, and paid but \$2.50 for the same service." "I don't care what others charge," was the reply, "my price is \$4.00, and I will keep my horses idle unless I get it." He does keep his horses idle, but it is needless to say that times are much harder with him than with his neighbors who have found out that the war is over, and are satisfied to take lower prices rather than do nothing.

A great financial disturbance like the present has a tendency to purify and develop the best traits of management and business ability in every one, just as a great war develops military genius. All business tact, energy, shrewdness, and every business principle is doubly valuable in these hard times. And this applies with equal force to any person, whatever may be his calling, who works for his living. Among the most important and at the same time the least understood of the many valuable qualities which might be mentioned, are economy, industry and frugality. In this age of the world, and of the American people particularly, we are too apt to lose sight of the principles which Benjamin Franklin taught in his Poor Richard's almanac, and the spirit of the age is rather to scoff at and deride those good old principles which our forefathers practiced. Some of these maxims of Franklin deserve to be printed in golden letters, and taught in our public schools. The tendency of the times is altogether at variance with these homely truths, and our boys and girls by overlooking these axioms acquire habits whose evil tendencies a lifetime cannot overcome.

For example:

He that by the plow would thrive,  
Himself must either hold or drive.

And again,

If you would have your business done, go; if not, send.

And this,

Diligence is the mother of good luck.

Here is one, the truth of which many in these times can affirm:

If you would know the value of money, go and try to borrow some; for he that goes a borrowing, goes a sorrowing.

And these express more than can be said in any other words:

When the well is dry, we know the worth of water.

Silks and satins, scarlets and velvets put out the kitchen fire.

If you would be wealthy, think of saving as well as getting.

Buy what thou hast no need of, and ere long thou shalt see thy necessities.

The eye of a master will do more work than both his hands.

Lost time is never found again.

He that has a trade has an estate.

These sayings are old and threadbare, but it is astonishing to see how little they are appreciated. The young man of to-day evidently lives but for to-day, and like the butterfly sips the pleasure of the hour with a total disregard for the future. A few weeks since, a clerk in one of our business establishments started in trade for himself. His employer told me that he had always been an industrious and careful young man, and had saved \$1,200 from his salary with which to start for himself. "But," said the merchant, "I venture to say that there is not another clerk in the city that is saving anything from his salary. They live up to every cent they earn." The proprietor of a sash and blind factory says that it matters not how large wages he pays, every Saturday night finds his employees in debt, and the money which is paid them is all spent before the middle of the next week. The idea of saving something from their wages for the future never seems to enter their heads.

Promptness, attention to one's work, and a knowledge of it, are also invaluable in any vocation. It has been said that man was born to be rich, and that he inevitably grows rich by the proper use of his faculties. Property is an intellectual production, but to get it requires coolness, reason, promptness and patience. Cultivated labor will always drive out the uncultivated. It is this

promptness and business acuteness which distinguish the successful from the unsuccessful man. A man who is prompt to pay his debts is generally prompt to collect what is due him, and inversely — he who is backward in getting that which is due him will be equally slow in paying his honest debts. If an account is due it ought to be paid, and no man has cause to be offended when asked for that which he really owes. There is a great deal of false pride in this matter, which the hard times are gradually eradicating from people's minds.

It may be said that these ideas are mercenary, and teach us groveling notions of life. Nothing can be more false. The real welfare of the nation and the welfare of every community is best secured by the morality, industry and frugality of the individual. We are all parts of one stupendous whole, and I am bettered by any improvement in the condition of my neighbor. That nation and that community is best off where all its members are solvent, industrious and contented.

Emerson says: "Business is a game of skill, which every man cannot play, which few men can play well. The successful man is one who has the just average of faculties we call *common sense*; a man of strong affinity for facts, who makes up his decision on what he has seen. He is thoroughly persuaded of the truths of arithmetic. There is always a reason, *in the man* for his good or bad fortune, and so, in making money. Men talk as if there were some magic about this, and believe in magic, in all parts of life. *He* knows that all goes on the old road, pound for pound, cent for cent, for every effect a perfect cause — and that good luck is another name for tenacity of purpose. He insures himself in every transaction, and likes small and sure gains."

We see then that to a great extent the remedy for hard times rests with ourselves. There is no combination of unfavorable circumstances so powerful that economy and industry will not help to overcome it.

— and though light-headed man forget,  
Remembering nature pays her debt;  
Still through her motes and masses draw  
Electric thrills and ties of law,  
Which bind the strength of nature wild  
To the conscience of a child.

## REMARKABLE PLANTS.

BY MRS. H. M. LEWIS, MADISON.

"It is pleasant to note all plants, from the rush to the spreading cedar,  
From the great king of palms to the lichen that staineth its stem.

—*Tupper.*

Throughout the whole world, nature has bestowed her gifts most bountifully for the good of man, but to the dwellers of the tropical world, she has seemed most kind, for she has given out of her great store-house a vegetation that supplies mankind with home, clothing, food, shade and shelter; all these gifts, she centers in her

## WONDERFUL PALMS.

The palms do not send out branches like the trees of our northern forests, but have a straight, trunk, terminating in a crown of gigantic, feathery leaves of great beauty. Nearly all kinds of palms furnish nourishing food or drink for men. The fresh sap from the tree furnishes a delicious beverage, and, by fermentation, an agreeable wine or brandy; a fine sugar is also produced from the sap. The soft and spongy substance, in the inner part of the trunk of the tree, produces sago, a single tree producing five or six hundred pounds.

The terminal bud of the cabbage palm boiled and eaten, with cocoa-nut oil, is a dish highly prized by the epicure. The ashes from some of the fruits produced salt of inferior quality, and the bread from the bread tree is both sweet and nutritious. The delicate bark of the unopened leaves is twisted and so used for making thread, valuable hammocks, cloth, etc. The leaf, after being submitted to a certain process, makes durable writing paper. A complete enumeration of the uses of the palm would fill a volume; the bread palm alone is said to be put to eight hundred different uses. The number of species already described reaches six hundred and probably when the tropical world is more fully explored, the list will exceed a thousand.

The Bread Palm is a native of the Pacific islands; it grows from forty to fifty feet high, rising half-way without a leaf. The fibrous bark is made into cloth, in the South Sea islands, and the fruit sup-



plies the natives with the principal part of their food. This fruit is oval, of a rich yellow hue when ripe, and about the size of a child's head. It is gathered for use before it is fully ripe, while the pulp is white and mealy. And is produced two and sometimes three times a year. In preparing it for food the South Sea islander cuts it in three or four parts, takes out the core, digs a hole in the ground, puts in a layer of heated stones, covers them up with green leaves, and upon this he places a layer of the fruit; then again the stones, leaves and fruit alternately, until the pit is nearly filled, when leaves and dirt are spread over all. Baked in this way it will keep fresh for several weeks; large pits are frequently made and parties join together to "do up the baking," and the occasion is quite a social event.

The Oil Palm is a native of Africa and grows from sixty to eighty feet high. The stems are thickest in the middle tapering upwards. The flowers smell sweet, like Anise. The fruit forms an immense head, like a giant pine-apple, consisting of a great number of orange-colored drupes, having a thin skin, oily pulp, and hard stone. The pulp yields by bruising and boiling, an oil, which, when fresh, has the delightful odor of violets, and when removed to colder regions, acquires the consistency of butter. When the oil is fresh, it is eaten like butter; the unripe nuts make an excellent soup. It yields from its trunk a pleasant and harmless drink, which, however, becomes intoxicating in a few hours.

The Palmyra Palm is a native of the East Indies; the stem attains a height of forty or even sixty feet, and is described by travelers to be a remarkably beautiful tree, with its magnificent crown of large fan-shaped leaves. The palm-leaf fan, which we enjoy so much on a hot day, is made from this leaf. The fruit is as large as a child's head, having a thick, glossy, dark-brown or black rind, and containing three seeds, each as large as a goose egg. This palm abounds greatly in the North of Ceylon, forming extensive forests. It furnishes a great part of the sugar, wine and arrack (an intoxicating drink) of India. Thousands of the inhabitants of Ceylon depend upon this tree for the supply of all their bodily wants. It is put to as many as eight hundred different uses.

The Date Palm often grows to the height of a hundred feet. This "tree of the deserts which plunges its foot into the water, and its head into the fires of Heaven," is a great blessing to mankind.



In the oases of the desert Sahara, groups of this palm are frequently seen, and what a priceless boon to the weary traveler in this desolate country it must be, for here is refreshing food, shade, and shelter, that give men and beast new strength and courage to press onward over the burning sands. This very interesting and beautiful tree seems doubly dear to us, for in its shade our Saviour found rest and comfort, when weary, foot sore and discouraged, and it is also of this tree, as Jesus approached Jerusalem that the multitude of people took "branches of palm trees," and went forth to meet him, shouting hosannas to His name.

Mohammedans believe according to the Koran, that Mary, the mother of Jesus, took refuge under this tree, and there gave birth to the Saviour, and by its fruits, she was miraculously supplied with food, for in shaking the tree (although it was without fruit, being in winter) ripe dates fell upon her for her refreshment, to "eat, drink, and calm her mind."

The Ivory Palm is said to be the most beautiful of all the palm family. It grows abundantly in South America. The stem is short, and sometimes so weak that it leans upon neighboring trees for support, but the leaf is magnificent as it rises thirty or forty feet in length, like an immense ostrich plume. The fruit is as large as a man's head, and consists of several nuts of oblong form, about the size of a hen's egg. The kernels of these nuts are exceedingly hard, and resemble ivory so nearly that it can with difficulty be detected from the genuine article. Many millions of these nuts are brought into the United States and England each year, to be manufactured into ivory ornaments.

#### OTHER REMARKABLE TREES AND PLANTS—NOT PALMS.

Cow Tree (*halo de vica*). A name given to a number of species of trees of different natural orders, the milky juice of which is used instead of milk. It is a native of Africa, and a lofty tree of beauty, with slender stem and dark glossy leaves, nearly a half yard long. For several months in the year not a shower moistens its foliage, and its branches appear dead; but the native pierces its trunk, and a copious stream of sweet, nourishing milk flows from it. At sunrise, when it flows most freely, the natives can be seen flitting to and fro with calabash bowls, and other rude vessels, to secure the milk; what a pretty picture they unconsciously make in the rich

morning sunlight. This milk is nutritious, and is much used; but if we were to analyze it, we should not find the milk of the cow, for it is more than one-half wax and fibre, with a little sugar, a salt of magnesia and water.

The Candle-Nut Tree is a native of the South Sea islands. This tree bears a heart-shaped nut about the size of a large walnut. An excellent oil is produced from this for food and lighting purposes. The inhabitants of the Society Islands, after baking the nuts slightly in an oven, and removing the shell, bore holes through the kernels and string them on rushes; then hang them up in their rude houses for torches and other purposes; these torches are much used in fishing by night, and burn with great brilliancy.

The Traveler's Tree (*Ravenala*) is a native of Madagascar, and is a vegetable wonder. When the young tree first appears, it bears several leaves, but as the tree grows, the lower leaves drop off, and in an old tree the lowest leaves are thirty or forty feet from the ground. The body of the tree resembles that of the plantain, but sends out leaves only on the opposite sides, like an immense open fan. The tree usually has from twenty to thirty leaves; the stalk of each leaf is six or eight feet long, and the flat parts of the leaf, four to six feet more. The fruit is not juicy, but is filled with a fine silk fiber of most brilliant blue, amongst which are thirty or forty seeds; the leaves are used for thatching, and for many other purposes, and the leaf stalk for the partitions and outer siding of houses. The leaf stalk contains about a quart of water; this is obtained by piercing the thick part of the base of the leaf with some sharp instrument, and the water obtained is pure, pleasant, and refreshing to the traveler.

The Grass Tree is a native of Australia, and from a distance resembles the palm. It does not attain to a great height, and is supposed to be many centuries old before it reaches four feet. It has a shrubby stem with tufts of long, wavy, coarse, grass-like foliage at the summit, which is highly relished as food by all kinds of cattle. A long cylindrical spike, covered with hundreds of pinkish-white flowers, shoots out from the center of the tree; the inner leaf after being roasted, is an agreeable article of food; a resinous juice exudes from the body of the tree, that is much used as a medicine, and when mixed with a certain kind of clay, makes a valuable cement.

The largest flower known is the parasitical *Rafflesia Arnaldii*. A well developed flower measures a yard in diameter, and weighs fifteen pounds. "Seen from a distance through the dark green leaves of the vines among which it grows, the rich wine tint of the flower, flecked with spots of a lighter shade, is said to impart a warmth and brilliancy of color to the whole surrounding scene." The center of the flower is cup shaped, and usually holds about a quart of water. It produces but one leaf, which is about fourteen feet long. Storks, and other large birds, walk over it with as much ease as if on dry land. The carrion-like odor of the flower is very disagreeable.

The Ink Plant is peculiar to New Grenada, and the simple juice is used without any other preparation. This vegetable ink is said to be of a redish color when first used, but becomes perfectly black after a few hours, and it is said to be so indelible that it keeps its color for all time.

The Flint Plant, although living and growing, exhibits no sign of life, as "it has no foliage whatever, but little pellicles of fine flint bud out of the twigs and stems, which latter are likewise encircled with rings of flint at every joint. In some places the flint, which it appears has exuded from the plant itself, cases the stem like a pipe." The bushy plant looks like a dead stick, but upon bending it, it will be found to be as tough as leather. One of these wonderful plants is in the possession of a gentleman in England, and he has refused large sums of money for it.

A dwarf tree was some time ago discovered in Southern Africa, whose summit never reaches more than two feet above the ground, and the woody stem never bears more than two leaves. These remarkable leaves appear as soon as the young plant rises out of the ground, and remain with the plant during its entire life, which is represented to be at least a hundred years. The leaf is green and about six feet long, and the flower stem shoots up from the stumpy body, between the leaves. "The leaf is flattened at the top, and like a folded card table, is divided by a central line, in two equal parts." In an old plant the leaves split into shreds before the tree dies. Two of these trees were on exhibition at the Centennial in Agricultural Hall.

The Resurrection Plant, of California, is both curious and interesting. When in a state of rest, it somewhat resembles in color

and form, a pine cone, with the exception that the Resurrection Plant has fine fibrous roots. If this dead-looking plant be put into a bowl of luke-warm water, the outer leaves will soon begin to unfold, and in a few hours this ugly cone will burst forth into a beautiful bright green plant, a single leaf measuring six or eight inches. If allowed to resume its vigor occasionally, it will keep fresh for years.

An electrical plant, a species of *Phytolacca* (Pokeweed), has been discovered in Nicaragua, which corresponds with the electric eel of the animal world. If the hand comes in contact with this plant, a shock of electricity like that from a galvanic battery is felt. A compass is sensibly affected when near the plant, and when placed in the middle of the bush, the needle turns with great rapidity and confusion. The intensity of the electricity is said to vary according to the time of day, being slight during the night, and at its hight an hour or two after twelve o'clock; during stormy days it is considerably increased. In dry weather the plant remains in a withered state, but with the arrival of rain it returns to its original vigor.

The insectivorous plant, *Dionea*, commonly called Venus' Fly Trap, is a very remarkable plant, found in the bogs of South Carolina. It is noted for the irritability of its leaf. The leaf stalk is large, and bears at the end a good-sized circular leaf, that has at the margin, long, stiff hairs; and having on its upper surface many small glands or bladders, and three irritable hairs on each side. If the insect touches one of these hairs, or organs of feeling, the two sides of the leaf immediately fold together, the marginal hairs holding it so firm that the prisoner cannot escape. The leaf will not open again until the insect is dead, and all motion ceases. Darwin and other eminent scholars startle us by asserting that this wonderful plant has the power of absorbing, and digesting its prey. If this be true, the all-absorbing question of to-day is: Where does animal life begin? Is it in the plant? The general laws which govern life prevail in plants, as in animals. If the plant has power to digest the insects, it must have some sense of feeling; if it has the sense of pleasure, it has also that of pain, as the two are inseparable. Is it feeling, that causes the sensitive plant to drop to the ground when touched by the hand? Who will explain the strange phenomenon of sleep in plants, as we see it in the clover field be-



fore sunrise, when every leaf is closed? Greek superstition endowed the *andropa mandagora* with all the sensations of an animal, and believed that it shrieked with pain when its roots were wrested from the ground.

A correspondent of the *English Mechanic* gives his experience with music, as a medicine for unhealthy plants. He had a harmonicon removed to the greenhouse, and indulged freely in music for some months. He says: "I was surprised to observe a gradual, yet rapid recovery of health on the part of my plants, and have thought it quite possible to impute it to the influence of music." He further says: "Nature is not complete without music — the songs of birds especially."

If his story be true, we can believe according to Hafiz, that "the rose appreciates the tender melodies of her lover, the nightingale." We love to think, that in the spicy perfume of the morning breeze, the millions of flowers that grow in valleys, deep dells, and over mountain sides have some faculty of expression — perhaps is wafted through each other's senses, a language. A language of love, the comprehension of which will to us be a heaven of delight when we are taken to the beautiful garden above.

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## THE FARMER AS A CITIZEN.

BY W. D. HOARD, OF FORT ATKINSON.

The farmer ought to be a very wise man. If he lacks wisdom, it is certainly not for the lack of an abundance of gratuitous advice which is showered upon him from the rest of mankind. Community at large is, however, deeply interested in any effort which may be put forth for the benefit of the farmer. His class is the bed rock of American society. He is the root and trunk of the tree.

Whenever he is prospered, all of the branches thrive. When the drouths of adversity dry up the fountains of his prosperity, every green leaf is parched and withered. In these latter days men are coming to see that "no man liveth to himself alone," that the whole web of society is woven inseparably together, and that



you cannot tear the warp without rending the woof. The question of government is engaging the attention of the people. The serious plunges which the good ship of state has taken within the past few years have caused the people to investigate the quality of her timbers.

The great question of to-day is not so much, Who shall steer the ship? as it is, Shall we have a ship to steer?

It needs no argument from me to convince you that the great crying necessity of the hour is manhood. We are wonderfully endowed as a nation with wealth and comfort; yet there is an undefined fear pervading the hearts of the people lest, with all the vastness of our treasure, we go to pieces on the rocks of bad citizenship. In this trying position, the farmer of all other men commands the key to the situation. I have been an interested observer of the farmer and the philosophy of his life for a number of years. I have found him possessed of one idea, which I cannot help thinking is an erroneous one. It is, that he is a different man than the rest of men; that the laws that govern his growth and prosperity, or decline and adversity, are exceptional. Hence he refuses to be judged by the same standard by which we judge men in the trades and professions. The effect of this notion has been to retard his true growth among men. I believe he should be held to the same responsibility as other men. Certain it is, that whenever you see the farmer rise to success or distinction, you will find he has done so by broadening his understanding of his relations with other men. The first thing a runner does is to strip himself of all unnecessary clothing. The first thing a man must do when he starts out to understand himself and the relations he sustains with other men, is to get rid of his prejudices. He must present a clean page to the impress of truth, not a scribbled one. There is but one universal standard, and that is *truth*. Truth asks no favors of you or me. She is merciless with us. We must come to the standard of hard fact, or pay dear for it. Every turn you and I have taken in life has confronted us with our ignorance. The three great ruling forces in society which have the most to do with moulding the character of men are, business, politics and religion. I put them in the order in which they occur in the evident estimation of society. These three have more to do with our citizenship

than aught else; and I propose to measure the farmer by what appears to me to be the best sense in each.

Good citizenship demands, in the first place, a good understanding of our business, that we shall be men, not babes, in it. Citizenship is that which every man dedicates to society. It may be good or bad. The interests of community imperatively demand that we make our business profitable. It demands that you make farming pay. Are you, as a class, making it pay? If not, why? The moment that question is asked, in steps that erroneous notion I spoke of, viz.: that the farmer must be measured and estimated differently than other men. If an editor does not succeed, you say it is because he lacks the right knowledge and its application; and you are right when you say it. If a lawyer fails, you say it is because he does not know enough; and you are right in saying it. The same with the doctor, the merchant and the preacher. Now what do you say when the farmer fails. Do you hold him to the same rule of measurement? No! you do not. You shift the rule too conveniently, and say it is because of poor crops, a bad season, or something God can be blamed for rather than man. Whoever heard a farmer say he did not succeed because he did not know enough? It is said that there are a few such instances on record. Now sharp eyed and intelligent farmers are getting sick of this cry against the seasons. It is a falsehood, and is proved such in every community. Scattered everywhere are farmers who are men of brains, who merit the praise of being finished farmers, as well as mere money makers. They succeed in all seasons. The average farmer calls them lucky, and turns to his worn out soil and worn out methods with a sigh and a thought that success is not for him.

Look at the history of farming in Wisconsin.

Thirty or forty years ago, you old pioneers came here and found a soil fresh from the hand of God, magnificently endowed with the richest fertility. You have farmed this land and lived off it, and now how is it? I speak the truth when I say that hardly one acre in a thousand of that land but has, under your management, depreciated fully one-third in productive power. Do you call that good citizenship that wastes the productive energies of the state? Now the spirit of Yankee questioning comes up, and I ask you seriously: Why is it that the men, to whom was delivered this magnificent heritage, will go right along witnessing a steady depreciation of

the productive power of their land, and still are so loth to turn sharply in the face of these lessons, and institute a new order of things? Can the farmers of Wisconsin stand up before the intelligent business criticism of community at large, and claim that they know enough to conduct their business, when for years they have been living on the principal of the original capital; or, in other words, steadily selling out "their farms, rock, stream and soil," by the bushel. Why is it, when nature has administered slap after slap in the face of wheat-growing, until her animosity to this shiftless kind of agriculture amounts to a public calamity, and is bringing the farmer and every other interest that depends upon him to the verge of bankruptcy, in the face of all this, why will he continue in the same old rut? Why is it, when he sees how prosperous grows the dairy farmer, how his land increases in fertility, how his capital is yearly growing larger by the possession of valuable money making stock, how new and commodious buildings spring up all around him, and he has money the year round to pay the merchant, the blacksmith, and the everlastingly hard-up printer; why is it, I repeat, in face of all this, the average farmer is so hard to convince that he is handling his business wrong!y?

Why is it, when the farmer can see every trade interest about him full of enterprise, intelligent and sharp combination in their own favor, he is so hard to arouse to any intelligent and energetic action for himself? Why is it, that so few agricultural papers are taken? Why is it, when, at some considerable pains and hard labor, a convention of some of the leading dairymen of the state is called, for instance, at Fort Atkinson, Sheboygan Falls or Appleton, that so few of the farmers attend who live in easy distance, and to whom the knowledge and ideas brought out and there discussed are of the most vital importance? Why is it, that not more than one in fifty of the farmers living in Winnebago county are in attendance upon this convention? Why is it that the farmers read so little, study so little, get together and discuss their business so little; in short improve so slowly and so little? These are questions which have bothered me for years. Some say the reason for all this is that the farmer has no time; that he must labor with his hands even if his head does suffer. That is not a good reason. The same is true of the lawyer, the doctor, the merchant, the editor, and every other calling in life.

The successful man in either must keep his hands full of employment. As a rule, the merchant works more hours than the farmer, and I know of plenty of professional men who keep employed sixteen and eighteen hours out of every twenty-four. The difficulty must be sought for elsewhere. It is in the makeup of the man himself. Compare the progress in agriculture with that of manufactures for the last thirty years. In the latter, the triumph of brains in every direction has been immense. One dollar employed in manufactures will to-day produce nearly if not quite one hundred per cent. more than it would have done thirty years ago. How is it with our farms to-day? Will they yield as much per acre as thirty years ago? Or, will they yield as much per dollar invested as thirty years ago? Our farms are worth more per acre but yield less; indeed, productiveness and value seem to be at inverse ratio with each other. Every county in the state is dotted with farms, the owners of which are anxious to sell and "go west." They have done all they could, apparently, to make the state poor by impairing its natural productiveness. There is a frightful waste going on in this direction.

What with wasted soil and wasted labor, is it any wonder that we find ourselves as a state, with such a decrease of revenue as to bring the wolf of hard times to our very door? Civilization has grown wider all about us, and it costs more to be a citizen than it did thirty years ago. To meet this draft there ought to be, not waste, but a constant increase in the productive power of the soil. Every trade and commercial interest in this portion of Wisconsin hangs on the prosperity and thrift of agriculture. This is in accordance with that principle of political economy, which teaches that in all communities, all interests will hang on that which is the largest in capital and extent. In the pineries it is lumber; when that prospers, everything prospers about it. In the mines, it is mining. Anything that eats out the productiveness and profit of farming, hurts every other interest. In my opinion, the simplest method to explain the present times is to say, we have not money enough. The reason we have not money enough, is that we have so little to sell. Your farm products command good prices, yet you have but little to buy money with. The great debtor class in Wisconsin are the farmers. They owe everybody, and can't pay promptly, and everybody is distressed.



We have gone on with a wasteful, unprofitable system of farming, refusing to listen to the verdict of nature and pocket, and when the cold blast of Hard Times comes, we shiver. Now do not the claims of good citizenship demand for the interest of the whole body politic, in a *business* sense, that we "right about face." We must settle our judgments down to the foundations of things.

## POLITICS.

The second leading demand upon the farmer is in a political direction. This is a republic. That means, it is a government of law derived power, public opinion. The convictions of the people to-day, become the law of the land to-morrow. The stream is never purer than its source — the laws are never wiser than the average honesty and intelligence of those who make them. Political sentiment divides into parties, and party action, party honesty and wisdom become government action, honesty and wisdom. In a republic, you cannot separate the party from the government. Whatever virtue, vice or ignorance belongs to the party, will reach through into government action. A party is simply a mass of men. The law that brings them together is a rope of many strands.

With one portion it is agreement upon questions of public policy, with another, it is the quest of leadership and power; with another it is educational prejudice; and another, mere blind following, and the cementing power of ignorance, vice and superstition. There is, of late, a dangerous and growing preponderance of the latter class. The voting intelligence of the nation is rapidly being diluted by ignorance and consequent vicious action.

It looks as though the struggle was practically upon us, as to which shall hold supremacy in directing the destinies of the nation, vicious ignorance or intelligent virtue. Right here the farmer occupies a valuable position for public good. He belongs to that great middle class, which is neither dangerously rich, nor viciously poor — which is neither crafty pleaders for power on one side, nor an ignorant rabble on the other. Of late, there has been projected into our politics a large and unreasoning element, which is not controlled by judgment, but by leadership. To such power has this class risen, that the stability of the government is seriously threatened. The history of the last seventeen years is pregnant with material for this conclusion. It would seem as if it was about



time for the great middle class, the farmers, to come to some intelligent standard of political judgment. There is great need of a powerful injection of the original American conscience into our politics. Is it not about time to square our political choice and associations by the standard of patriotism, honesty and intelligence? Take those three elements and apply them as a score line to every party that comes to you for support.

We have every reason to believe that the future contains other great and serious conflicts for the life of our noble republic, and it is to the farmer citizen in particular that we must look for that staunch, intelligent and conservative support, which must be accorded to the principles of civil and religious liberty. Here then, is a wide and responsible position which he must fill, and better will it be for him and the nation if he fill it wisely.

He will find that here, as in his business, there needs to be a fertilizing of the intellect. He must study the situation, for to him will be constantly referred the solution of its difficulties. He must train his mind to a more thorough discrimination of duty, and to that end must study politics. Not for the sake of party so much as for the sake of his country, and the supremacy of order and good laws. Large drafts are made in this field upon his citizenship, and how necessary that he should enrich it with a generous culture and understanding of the inexorable logic of his situation.

#### RELIGION.

Bismarck wisely says "That statesman will make a terrible mistake, who, in estimating the forces he has to deal with in governing society does not give to religion a prominent place." The meaning of this is, that it is through religious bias, prejudice and understanding, that a large majority of men receive their convictions of public duty. Their ideas of citizenship are moulded by religious feeling rather than by a clear intellectual understanding of the true and just proportions of that citizenship. Now, in what I shall say I wish to be understood, as speaking of religion as it exhibits itself as a power in politics. Religion presents two phases, first as a power working on the conscience and emotions of men, inclining them to a worship of the Supreme Being. Second, as a power in the material affairs of men, coming from the law of aggregation or the correlation of forces. For instance, a number of men actuated

by a unity of religious sentiment cast themselves into one body. This cohesion not only gives them power to perpetuate religious belief, but also gives them power in social matters, and enables them to mould opinions on matters outside of religion. This aggregation we call the church, and its power over the political motives and acts of men we call religious power. Power is like a razor—if you guide it rightly it will cut your beard; guide it wrongly and it will just as willingly cut your throat.

There is a wonderful profusion of examples on the page of history, showing how ecclesiastic power has been used under the push of an ignorant religious sentiment, to the great hurt of liberty and a broad, true idea of citizenship.

Jesus Christ was a magnificent democrat, and it was his unyielding adherence to the rights of man that made him utter that sharp rebuke and sound governmental doctrine "Render unto God the things that are God's, and unto Cæsar the things that are Cæsar's." Certain events which are transpiring indicate that severe battles will yet be fought in this republic, between ecclesiasticism and republicanism. We can see the spirit of Jesuitism gradually pushing its way along, doing what it can to weaken the fealty of its followers for the prior rights of citizenship.

This being a republic, and the school house being the most potent influence, whereby men are emancipated from ecclesiastical control, the attack is made here. Propogandism and love of power is the same, no matter under what name it sails, whether Catholic or Protestant, and any attempt to place the school under religious control is born of the same spirit. Right here is the place for the farmer to stand up and say to the encroaching spirit of ecclesiasticism, "stand back," keep your place; that which belongs to Cæsar, or the state, shall the state have.

We see how essential to the preservation of the spirit of American liberty is the idea of true citizenship, and the estimate we place upon that citizenship will mark the measure of our power and force as a citizen. The insane religionist will cry, my religion and its demands first, which, in other words, are the demands of church, and the demands of my country afterwards. The intelligent religionist and true citizen replies, If you have no country where is your church? If you have no civil liberty how can you enjoy the ministrations of your religion? Build your citizenship and your relig-

ion each in its proper place, and repel all invasion of one upon the other. History, "with its sad, sad lesson," and reason, both fasten the conclusion that our first duty is to the upholding of liberty and the establishment of good government. When the struggle comes, as come it will, between ecclesiasticism and government of the people, and by the people, you farmers will be no disinterested spectators of the contest. Then will occur the grand opportunity to show the quality of your citizenship, whether it is grounded in a broad and abiding notion of what constitutes liberty guided by just laws. Here comes again the grand effect of culture, study and right training in teaching you what your rights and duties are, so that you may become a solid wall of resistance against all enemies of American liberty and individual independence, whether they come in the guise of a lack of good business energy and intelligence, the arch demagogue and his ignorant following, or the dangerous aggressions of priestly influence.

Remember that the deadly foe of all these is enlightenment. Let us lay broad and deep the foundation of our citizenship.

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## MENTAL HYGIENE.

BY WALTER KEMPSTER, M.D., OF THE NORTHERN WISCONSIN HOSPITAL FOR THE INSANE.

Hygiene is that department of science which treats of the preservation of health. Mental hygiene consists of a system of principles which have in view the training and preservation of the mind. As those nations and cities are healthiest which pay proper attention to hygienic surroundings; to the full development of the laws governing health, so those nations are most intellectual whose inhabitants seek to develop the mental faculties by paying proper attention to the laws governing the operations of the mind.

No fact of history is better established than that the nations endowed with the highest intellectual culture have been the longest lived and most influential, and that when culture waned, when luxury and consequent indolence supplanted mental effort, then did the people decline and the nation pass out of sight, to be eventually obliterated so far as influence is concerned. The history of

Athens, of Rome, of Sparta, all confirm the statement that when mental culture gave place to effeminacy and indolence their prowess waned, and the schools that gave to the world Plato, Demosthenes, Socrates and others were closed forever.

No state or nation can long maintain its supremacy which ignores in whole or in part the principles which govern mental hygiene, and this fact has actuated the movements of the most marked characters in history, who, while they may not have realized the reasons why mental discipline produced the soundest men, yet it is evident that they accepted it as a fact, and appreciated its vast importance as we shall presently see.

But you say what has all this to do with the farmer's home; and what has a farmer to do with high intellectual development? Let us see. Since the day when the mandate went forth "in the sweat of thy face shalt thou eat bread," the great masses of mankind have been engaged in tilling the soil. The farmers everywhere have been the advance guard of civilization and to them more than to any other class of people belong the credit and honor of giving tone and character to communities. It requires no argument to prove this, it is everywhere patent, and in simple justification of the statement, we have but simply to call your attention to the evidences which exist within your own jurisdiction. To the honor of those men who first tilled the soil of northern Wisconsin, and there are some now within the sound of my voice, be it said that they fully appreciated the importance of mental hygiene, and in testimony of their appreciation have placed landmarks that are silently working out the problem of how it is best to accomplish a high state of civilization. I refer to your institutions of learning at Ripon and Appleton, and the wayside schoolhouses that dot every township containing a dozen families within the borders of the state. We may safely say, then, that farmers do have something to do with mental hygiene; and they have more to do with it than the mere building and supporting of schools and colleges. Knowingly or not, it begins in the farmer's home and it is in their hands to give direction to public thought and future public policy. Some one has said "give me the first seven years of a child's life, and I care not who has the rest." The statement is a random one, but it illustrates the importance and advantages of early development and training; and the fact is not sufficiently appreciated, perhaps, by those who



have the terrible responsibility of directing the current of a young child's thoughts. Again, in answer to the query "what have farmers to do with mental hygiene," let me say that it is from the farmer's home that the ranks of every profession are recruited.

Francis Galton in his work on Hereditary Genius shows by facts that are uncontrovertible that it is the constant accessions made to the families of scientific men of all kinds by the introduction of new blood that keeps the ranks full and the column moving on. It is therefore of the highest importance that mental hygiene should be fully understood by the farmer, at least as far as it relates to starting the child in the right course and providing him with the means of developing his intellectual faculties in the direction which his genius appears to take; and this is one of the most important points to bear in mind in attempting to guide the current of intellectual acquirements. Innate genius will creep out, no matter how much you may endeavor to repress it, no matter how far it conflicts with your ideas of what you have designed for the future of the child, and the sooner full head is given to this fact the better will it be for mankind. The shore of Time is lined with the wrecks of manhood, driven by adverse opinion, or by compulsion made to engage in those mental operations which were distasteful, and, which persisted in, brought ruin, both mental and moral, to the victims. Who are they who have acquired highest distinction in the various walks of life? Not those, surely, who have been compelled to enter upon duties distasteful, or to engage in intellectual processes which were uncongenial to their earlier years.

But we have not the time to enter into a discussion of the reasons (and they are many) why this should not be done. We can but lay before you certain facts, bearing directly upon the importance of the work of developing the best intellectual acquirements, of the necessity of exercising care in guiding the operations of the mind, instead of blindly attempting to force it into channels which it will not flow in smoothly, no matter what the penalty may be.

The intellectual culture that has marked eras in the history of the world has not been acquired in the higher institutions of learning; it has been acquired at home, and often in spite of adverse circumstances and surroundings. History and biography relate that we are not to look to the high school or college for the highest type of intellectual endowment, as the best trained mental hygienists we



shall find that those men who have by their public and private acts greatly benefited the human race received only that training acquired at home; or, later in life, fitted themselves by self-imposed mental discipline for accomplishing the work they had laid out. In whatever department of human progress we may seek for information upon this point, we shall find the statement true. It is the home-trained, self-made men who have accomplished the world's work, who have done the greatest good to mankind.

Recently an admirably prepared statistical article appeared in one of the English quarterlies, containing the names of several hundred men, eminent in science, art, literature and the professions, and giving their antecedents in mental discipline. Strange as it may appear, nearly all those who were pre-eminent had been trained either in small schools, at home, or had trained themselves. If we look to the department assigned to rulers and statesmen, we shall find mention made of Constantine the Great, whose early advantages were very meager, but by wholesome self-discipline and study he attained to the highest eminence as a conqueror, then, laying aside every vestige of force, he reorganized his country and established laws for the government of his people which are in force to-day.

Charlemagne was almost entirely self-made, and yet he was one of those extraordinary men, who have from time to time appeared to change the face of the world and inaugurate a new era in the destinies of mankind. He introduced admirable civil government in a country previously torn asunder by dissensions; he patronized civil and religious liberty, fostered literature and the arts, and contributed, by precept and example, to the betterment of mankind.

Alfred the Great, who founded the University of Oxford, could not read at the age of twelve, but subsequently became a patron of schools and universities.

Peter the I, of Russia, was exceedingly unlearned, but on acquiring high rank, and before assuming his functions as emperor, he left Russia to acquire an education, and worked at menial service that he might carry forward his grand object, finally returning to his country with men of science to aid him in his prime object, that of educating his subjects, he paved the way for the future of Russia, so far as a liberal policy toward art, science and literature are concerned.

Alexander the II, who continued the good work commenced by Peter I so many years previously, was educated at home by his father, and rendered his name immortal by emancipating the serfs from their bondage.

But we need not confine ourselves to royalty to illustrate the point in question, nor is it necessary to go away from our own shores for illustrious examples. Washington had very little schooling; his early education did not go beyond reading, writing and arithmetic.

Franklin had no advantages save those that he carved out by his own sturdy self-dependence and indomitable perseverance.

Patrick Henry was taught only in the primary departments; all the other branches of his education, and they were many, he acquired upon a farm.

Thomas Jefferson did not complete his college course, finding more congenial methods of education and of mental discipline in general reading.

Andrew Jackson, as a boy, would have nothing to do with schools, and played truant constantly.

Hayne's early education was exceedingly limited, but his determination to acquire knowledge placed him in the foremost rank of his time.

Zachary Taylor lived on a farm until he was twenty-four years of age, and picked up his education there. We might extend the list indefinitely, but can speak of but one more under this heading.

The highest type of a self-made man, embodying the most wonderful possibilities that may come to a human being, born in obscurity, reared in poverty, and engaged during all the earlier years of his life in lowliest toil, hewing a path to immortality through the most adverse circumstances and surroundings, but his mental drill and discipline enabling him to give expression to ideas rarely equaled and not surpassed, for purity, force and pathos, whose utterances have become proverbs; a man to whom it was given to release four millions of human beings from bondage, whose whole life is a mystery, — such a man was Abraham Lincoln. What may we not expect, if from such a school can come forth such a man? Surely among self-made men he is most conspicuous of all.

If we turn to the department of philosophy, wherein the finest and highest mental drill is required, we find among the most emi-

nent are those who have not received collegiate or even academic drill.

Immanuel Kant would not and apparently could not continue in the path of study laid out for him. He was what in college parlance is called a "browser." John Stuart Mill, in many respects the most eminent among modern philosophers, was entirely educated at home, by his father. Herbert Spencer, whose writings have been more generally read throughout the civilized world than any other philosopher, recent or ancient, had no school discipline; he too was educated at home, and trained himself. Among the ancient philosophers, who does not recall the career of Demosthenes, with his mouth full of pebbles, walking and declaiming in solitude, that he might overcome his infirmity. In science, we find Louis Agassiz, who educated himself; Joseph Priestly, Humphrey Davy, Michael Faraday, whose father was a blacksmith, and who apprenticed the son for seven years to a bookseller; from poverty and obscurity he struggled upwards until he occupied one of the most exalted positions among modern scientists. Copernicus had only the rudiments of an education. Isaac Newton was so backward in all his classes that he was the butt of the school, and when he finally received his A. M., it was more for what he had accomplished outside his course than for what he had done in school. Linnæus was so obstinately slow in school that his teacher advised his father to make a tailor of him. Galileo came from poor parents, educated himself at home, and became one of the most remarkable men that ever lived; hardly a piece of machinery exists at this day but that in some way embodies principles first enunciated by this specimen of a self made man. Helmholtz, the greatest modern scientist, did not have a classical training, and he has no living superior as a mathematician. Alex. Wilson, the ornithologist, was entirely self made. Huxley had only two and one half years schooling, his immense knowledge of natural history was obtained at home, or by his own devotion to his department of science. Hugh Miller, the son of a poor sailor, wrought out among the rocks and crags of Cromerty, with hammer and chisel, a reputation which is enshrined among the most prominent of all the prominent men that rough, bleak, magnificent isle has produced. His book, *My Schools and Schoolmasters*, should be in the hands of every boy who cares to know what force of character, vim and grit will accomplish.

Of poets, we have among the so-called uneducated: Shakespeare, of whom Ben Johnson says, he had little Latin and less Greek, the two studies which in those days were considered essential to admit a man into the ranks of the learned. Henry Kirk White, whose exquisite tenderness has moved many a heart. John G. Whittier was and is a farmer, and is self educated. Robert Burns was self made and a farmer. John Howard Payne, whose pathetic "Home, Sweet Home," will forever preserve his name from oblivion, was poor, self educated and self made. Thomas Moore was self educated, and William Cullen Bryant, one of the most brilliant among the host of modern poets, did not complete his college course, finding more congenial mental drill in other places.

Among mechanics and inventors, we have Sir J. Whitcomb, Erichson, Sir William Fairbairn, Stephenson, who could not read when he was eighteen years of age, but who laid the foundation of a practical education of immense advantage to the world at large, and has perhaps done more good to mankind than a knowledge of Latin and Greek alone would have enabled him to do. Brunel was the son of an humble farmer, and had no early advantages whatever. Guttenberg was a self made man. De Lesseps, the engineer of the Suez Canal and many other notable works, is entirely self made. Robert Fulton and Elias Howe were both poor and uneducated. Colt ran away from home when forced to go to school, and took his own way to work out his reputation. James Watt was altogether self made, and in spite of the scoldings oft repeated for blacking his clothes with the tea kettle, continued to play with it to some purpose. William T. G. Morton was a poor boy, who won his own way to notoriety. On his tombstone there is an epitaph unlike any other in the world: "William T. G. Morton, inventor and revealer of anesthetic inhalation, by whom pain in surgery was averted and annulled, before whom, in all times surgery was agony, against whom, science has control of pain."

If we turn to literature we shall find that self made men, men who begun their mental drill at home, occupy a prominent place upon the roll of fame: Samuel Johnson was so poor that he could not attend college.

Humboldt was educated at home. Thomas H. Buckle had a limited schooling. Gibbon did indeed received in part a college course, but he himself says of that time, "To the University of Oxford I



acknowledge no obligation; and she will renounce me for a son, and I am willing to disclaim her as a mother. I spent fourteen months at Magdalen College, and they proved the fourteen months the most idle and unprofitable of my whole life." And yet this man who spurns his alma mater wrote a work which has been characterized as the greatest creation of a single intellect, being no less than the history of the world for thirteen centuries. Poor Goldsmith did indeed stick through college in a garb which was intended to indicate to everyone that he was a pauper, and which he was obliged to wear.

Elihu Burrett was apprenticed to a blacksmith when he was sixteen years of age, yet acquired the mastery of a greater number of languages than many of the most distinguished linguists of modern times, and this he did by working with his brain as well as his arm, pinning a leaf of his lesson to the wall of his shop, where he could learn to translate Oriental languages while he also translated iron bars to horse shoes.

Livingstone, the traveler and writer, was another self made man, storing away information while at work in a cotton mill near Glasgow, and Stanley, who sought out and found him amid the jungles of central Africa, and who has taken up the work he left unfinished, spent the early days of his life in a poorhouse, where he was sent, when three years of age, and where he remained until he was thirteen.

In England, where her great universities have for so long a time controlled the matter of education, and where we may suppose they exercise the greatest influence for good, we find that the most influential minds of the century past, in science, art, literature and politics, have had no connection with universities, and are self-made men.

In politics and political economy we name, among others, Romilly, Bentham, Ricardo, Bright, Cobden, and Stuart Mill.

The men of science present a larger roll, and inscribed thereon we find Davy, Wollaston, Dalton, Faraday, Wheatstone, Delabechr, Murchison, Hind, Smith, Fitzroy, Playfair, and Carpenter, and it might be indefinitely extended. To which of the universities shall we go for a similar list?

Her inventors and engineers are none of them college drilled. Telford, Smeaton, Rennie, Brindley, Sir Joseph Paxton, all acquired their reputation without the aid of college drill.



Her artists are all self-made. Flaxman and Gibson, Landseer and Turner, Stanfield and Kemble, Macready and Benjamin West, and to these may be added from other countries, Peter Paul Rubens, Raphael, Claude Loraine, Hayden, Bierstadt, F. E. Church, Peter Moran, Hiram Powers, the sculptor, C. L. Elliot, the great portrait painter, who was educated in a country store. In turning again to England we find "the greatest historical work of this generation, on classic history too, was written by an uneducated London banker, The greatest and almost the only English attempt at a philosophy of history, and which cannot be matched by any similar academic performance, was the work of the uneducated son of a London merchant, George Henry Lewis, himself a philosopher of high culture.

"Among her poets, critics and essayists, what a long list are among those who began their mental discipline at home. The names at once occur of Crabbe, Rogers, Lamb, Montgomery, Hunt Gifford, Hazlitt and Hood. Who would hesitate to say where Walter Scott's real education lay?

"Who has criticised the education of Oxford so wittily as Sidney Smith, or so grimly as Carlyle? Wordsworth and Coleridge, in their short stay at the university, owed little or nothing to the studies of the place. Southey says he only learned to swim there, and that badly. Byron was ruined there, and the beautiful genius of Shelley found there, instead of the help and guidance it so much needed, only cruel and ignominious abuse."

"Keats, some of whose exquisite poems breathe the very spirit of classical antiquity, was a stable-keeper's son, who never studied at public school or university."

"Bacon reprobated the constitution of the English universities."

"Dryden abjured his alma mater, and regretted that he had passed his youth under her care."

"Locke was censured and expelled."

"Milton had his person outraged at one university, and his works were committed to the flames at the other."

But it is unnecessary to pursue this subject further; page after page of names most eminent in all the departments of progress could be drawn from both ancient and modern history to illustrate the point that mental hygiene is not confided to the keeping of colleges, is not confided to academies, but is confided to individuals, and that its true discipline begins at home.

If we turn to the history of these great reforms which mark, like mile stones, the progress made in the path of time, we shall find that it is not the college bred student that has been instrumental in inaugurating the movement. Selecting for one moment the most prominent in all time, the reform that was destined to change, as it were, the face of the earth, which overturned empires, kings and princes, the reform to which the name of Luther is so prominently associated, we shall find that the reform itself sprang from the hearts of the people; more than eighty-three years before Luther was born, this great reformation in religion, politics, government and learning, took shape in the Swiss cantons.

The John the Baptist of this wonderful reform was Hans Boheim, a drummer, who preached to the peasants, in 1476, that all men were brethren and equal, that they should arise and throw off the yoke of thralldom which had been riveted so securely about their necks for so many centuries. Again in 1512, the reform movement found another leader in Joss Fritz, who talked to the peasants of their burdens, of the wealth of their oppressors, of the injustice of their blood being spilled in the quarrels of their lords and princes, of how they were robbed of the game of the forests, the fish of the rivers, which in the sight of God were free, like the air and the sun, to all men; and here they ought to have no masters but God, the Emperor and the Pope. He raised the banner of the *Bundschuh*, or peasant's clog, which became their rallying point, and on which were inscribed the words, "O Lord help the righteous." Of course the movements were crushed, thousands were put to death, and the leaders hung, drawn and quartered; but the train was laid, where serfdom was at its worst, but where freedom was nearest in sight, where the traditions of ancient freedom had lived the longest, where the spirit of the people was least subdued, the reforms were taught by the firesides of the hardy mountaineers of Switzerland. It was these repeated rebellions against feudalism, on the part of the oppressed peasants, that first opened the door through which these men, who guided the spirit of reform, afterwards walked. It was left for Savonarola, for Colet, for Erasmus, for Melancthon, and finally the daring intrepidity of Luther, to finish the work begun by peasants one hundred years before. Had it not been for the wide spread determination of the peasants to be free or die, Martin Luther's name would have been added to the roll of martyrs.

This great reform characterizes others not necessary to speak of. It is not in the schools or colleges that great works begin, it is by the firesides of the people, and so it was in our own history, the one hundredth year of which has just closed. Who among its leaders could boast of college drill? Nearly every one of them rose from the ranks, and perhaps none more conspicuously so than Patrick Henry, the firebrand, who ignited the train that burst the bands King George sought to fasten on our country.

You must excuse the digressions I have made, but it serves to illustrate, better than in any other way, that classical education, that college training is not necessary to produce leaders in any department of human progress, and it teaches us another fact, which comes nearer to our real subject, and that is, that as farmers have always outnumbered other classes of workmen, it is fair to assume that the mental drill, the mental hygiene practiced at the home of the farmer, has been largely instrumental in producing the marked men in all ages, and in giving expression to the "will of the people" in the work of great reforms.

The practical outcome of this matter is of great utility, Why is it that the ranks have given to the world the eminent men in science, art, literature, politics and reform? Why is it that after years have been bestowed upon the education of a man in school and college that he does not rise up as the trained leader in all that pertains to progress? Without delving into that which is past, let us see what the influences are at present which set up the unclassical man, and which detracts from classical education. I say that we will not delve into the past, because in looking quite carefully over the ground, I find the same causes prevailing in the past that are now operative, and we shall save time by considering both together.

While it may appear presumptuous for me to express views upon a topic which has for so many years attracted the attention of men of great learning and experience as educators, I trust that the motive may not be misconstrued however, and if in error, it is one of ignorance and not intent.

There are certain laws governing mental operations, which, if transgressed, bring a penalty swift and sure, and it is certain to follow the transgression of the law. It has been a matter of common remark among educators, that the boys who stood first in

school disappear in the colleges, and those who stood first in the colleges disappear in the world; indeed it appears from what we have seen of the earlier life of some of the most prominent men, that those who have been of most use to mankind, those who have been most successful in after life, are *not* those who had received the benefits said to be derived from college training, but they would be found among those who had thrown off the course prepared for them, and with independent energy marked out their own career. As it appears to me, the mistake has been that our higher schools, and indeed I may say, all schools appear to have ignored the fact that men are born into the world with aptitudes, requiring an infinite variety of means for their development, in order to meet the indications for each particular case.

How often has it occurred that a career has been mapped out by some fond parent for his child, for which the youth in his intellectual development was wholly unfitted and could not be made to follow.

The father of Isaac Barrow, who was regarded as the best scholar in England in 1675, said that if it pleased God to take away any of his sons, he prayed that it might be his son Isaac, as being the least promising of them all; and who has even heard of either of the other sons? The attempt to run all minds in one mold is a terrible mistake, and year by year the effort is constantly being made to cut off, or pull out, all persons to be educated, to fit the procrustean prepared by the educators.

When a youth goes to college, he must take the prescribed course of study laid down for him whether he likes it or not, whether he has any aptitude for that particular study, or whether it is revolting to him. No matter; it is the rule and must be conformed with.

Now how does this apply to the schools to which the farmer sends his children; entering the country school house in the autumn, after having expended his energies upon the farm fourteen hours out of the twenty-four during all the summer, he takes up reading, writing, arithmetic, history, algebra, grammar, spelling, some one of the natural sciences perhaps, and indeed a variety of studies to suit the fancy of the teacher for that particular term, spending nine to twelve hours each day in a close hot room. The brightest scholar in each class is made the standard of the class, and all other in-



tellects, no matter how bright they may be in other departments, or how dull they may appear in one, they are forced to equal the champion or receive a demerit in the teacher's book. Compelled to fit into the niche carved for them by another or stand disgraced, how fares the child? He cannot study in the school, because he must recite while there, consequently when night comes the books are packed up, taken home, and after chores are done, the deficiencies of the day must be made up and the lesson for tomorrow dug out; no helping hand, no leading suggestion, the work becomes independent, original investigation, the highest, most laborious mental discipline there is, moreover it may not be a labor of love; the mind of the youth may revolt at the work, in which case it becomes all the harder. Then too, as though this were not enough, he must be fitted for a public speaker, and declamation is added to his load; an essay must be prepared for Friday afternoon and "there are probably many school boys who have exhausted themselves more on a prize composition than Shakespeare did over Hamlet, or Milton, over the choicest passages of Paradise Lost."

The peculiarities of children are not taken into account; one may have an appetite for history, another mathematics, another the natural sciences, and each may dislike the other branches; but whether they will or no, as our schools are now constituted, they must conform to the rule or leave, or in staying they must open their mouths and swallow the dose, or have it crammed down their throat. This same process is continued throughout the entire course, except that as you get into higher institutions, stimulants to exertion are offered in the way of prizes or in marks; the young brain, strained and exhausted in the primary departments, is spurred onward in the college course, until at last it yields to the terrible effects of over-work, and the man drops out of view. It was only last week that I read of a young man in one of the eastern institutions of learning, who had received a three hundred dollar prize for passing the best examination in Latin, at an inter-collegiate contest, but who was so thoroughly exhausted by the process of preparation, that on returning to his college he committed suicide. Go with me through yonder institution, and I will show you one, and another, and another, who have fallen, not only out of their classes, but out of the walks of life, perchance of lives of great usefulness, had they been trained in a proper manner, the fall being due to overwork and mental



strain. I do not wish to appear before you in the light of an alarmist, but I give it you as my opinion that immense harm is coming upon the brains of the children of this land, by the hot bed system of forcing education (so called), where the soil is unfitted for the seed that is sown, and which no amount of training can properly prepare, because of the mental inaptitude of the individual to comprehend the subject they seek to teach him. The laws governing the development of the brain are as widely diverse as are the individuals; indeed, each child is a law unto himself; in the one case the mental vigor is great and active in certain lines of thought, in the other it is slow and apparently inoperative until later in life.

We are told that Chalmers was dull, stupid and mischievous in school; that Adam Clarke could do nothing but roll great stones about; that of Sir Walter Scott, his teacher said, "dunce he was, and dunce he would remain;" that John Howard, and Napoleon and Wellington were remarkable at school only for their inability to learn; and the Iron Duke is reported to have said of himself that another year at Eton would have ruined him for life.

Newton was very inattentive to his studies, and stood low in his class, but was a great adept at kite flying with paper lanterns attached to them to terrify people of a dark night with the appearance of comets; and when sent to market with the produce of his mother's farm, was apt to neglect his business, and to ruminate at an old inn over the laws of Kepler.

Thought is developed slowly; it is locked up in the brain cells, and must find its own way out. In the brain of that stupid youth who is kicked for his absent-mindedness, "grand thoughts may be silently growing, and the intellect that to-day looks stunted and dwarfed may hereafter quicken into life, rise into strength and beauty, to give fruit and shade to many generations. Indeed, the majority of the greatest thinkers of the world seemed dull, inane and stupid to their neighbors, not only in childhood but through their whole lives."

The period of greatest importance in the development of the human brain is from the seventh to the twentieth year, and it is during this period that it receives the gentle disciplinary stimulus to insure future culture and growth, or is strained and weakened so that it becomes almost incompetent to perform the ordinary functions required by the daily round of an uneventful life.

It appears, then, from what has been stated, that the men who have succeeded in accomplishing the most intellectual work are those who have been untrammelled in the choice of their studies, and have followed the line of the genius that has developed within them. It also appears that the ablest men have bid defiance to a prescribed course, and have selected congenial intellectual food, and that thought, coming over the subject selected, viewing it in all its aspects, dwelling upon all its phases, is the grand element of success in mental drill. I do not wish to be understood as condemning schools and colleges. Far be it from me to suggest for an instant such a thought; but I do say that the present system of saddling from six to ten studies upon a child is radically wrong. I want it to be understood that the school is the place for teaching, not reciting; that the scholar must be *led*, not forced, and when special mental aptitudes become apparent, it is worse than useless to attempt to repress them; and again, when special aversion is manifested towards some study that does not appear to be within the comprehension of the child, it is a positive detriment to force it, for by so doing the child is dwarfed and its ambition is dashed. The report of the committee appointed at the Vienna Exposition to examine and compare the text books offered by the several nations says of American common school books, that they appear to have been prepared for the use of incompetent teachers, people who were employed to hear the recitation of, and not to teach the child, and to those of you who are familiar with the methods of education employed here and abroad, the statement will come home. There the teacher teaches orally, and the scholar takes notes and prepares himself for review. Here the scholar digs out the result the best way he can, and if, in recitation, the answer is incorrect, he has no one to blame but himself, and down goes a mark against his record. Again, our schools, as at present constituted, do not aim at practical training, and an eminent writer in commenting upon this subject, says, that "the instances of practical errors occasioned by the methods of training in merely abstract reasoning are matters of notoriety. Reasoning upon the habit of abstract mathematics, without reference to the real nature of friction, the late superintendent of a celebrated dockyard who was eminent as a calculator, once declared that if a locomotive could be produced which would drag a train of cars without cogs, he would undertake to eat locomotive,

rails and all, yet a strictly academical examination would have passed him, and would have excluded those who made the locomotive do the work. It would have admitted gentlemen who write able articles to the Review to show the impracticability of crossing the Atlantic by steam, and it would have excluded those who accomplished the fact. It would have admitted those who condemned the screw propeller, as being contrary to the abstract law that action and reaction are equal and contrary, and it would have excluded those who effected the improvement. It would have admitted such men as the astronomer royal, who brought before the institution of civil engineers an abstract calculation to prove that the crystal palace could not stand; and it would have excluded the gentlemen who designed it and made it stand." What we want to-day is practical demonstration. Time was when Greek and Latin were perhaps necessary for mental drill and discipline, but to-day we must have that mental drill which best befits the ages in which we live, and to go back to the systems in vogue ages ago for methods of improving the intellect, is to be going to the stage coach for rapid transit, and to the old letter post for rapid communication in these days of steam and electricity. Mental drill can be obtained as well upon a congenial, practical study as it can upon Greek and Latin roots. The habit of thought can be cultivated upon present living issues, as thoroughly and completely as it can be upon subjects that interested Greek poets or Athenian philosophers.

And here let me say what I have previously intimated, that the discursive methods employed, introducing a half dozen subjects at once to the opening intellect of a growing child is injurious, because he cannot grasp them; he cannot give them the study and thought that each demands, in order that it may be fully comprehended and fixed firmly in the memory. Consequently the whole range of study is galloped over, is not understood, and soon falls out of memory altogether. One fact well learned is of more value than a dozen axioms thrown out at random, to be stored up or not as the aptitude of the child shall determine. These mental aptitudes can no where else be so quickly determined as at home where each trust is watched in its development until the child reaches the question asking age, when the whole of its little world opens up its treasures day by day as new and strange as the face of a foreign

land is to a traveler. Then the child is bundled off to school, because it is tiresome to answer the questions, and at school you know they are not allowed to ask questions; and so the ambition of the youth is effectually headed off, and he is led to suppose that some gross impropriety attaches to the habit, and his mental memorandum is, that questions are not to be asked. It is said that the father of John Stuart Mill exercised the child for two hours every day by requiring him to ask questions about everything he saw or could think of, and that when he could think of no more questions, the child was required to repeat all the words he could think of; and to this habit he attributes his wonderful command of English words, and the various uses to which they may be put.

This stifling process, as it may be called, is the best way that could possibly be devised to dwarf the intellect and prevent mental drill. Let the child ask questions, it is the only way he knows of to acquire information, and he will probably not find a better plan in later life; and if you cannot answer them all (and few of us can), then quietly lead him into another channel; you may depend upon it, the answers will not be lost, he will utilize them in due time, and if you are not careful they will be utilized to your own disadvantage.

What are we doing in our homes to develop thought and encourage mental discipline in the young? The mind is always active in the young during their waking hours; it must be employed; it will accomplish something, either for good or evil; it will not lie dormant.

The complaint is constantly being made that the young men will not stay at home upon the farm; that as soon as they get over boyhood they want to be gone to the cities. Well doubtless this is true; but what are you doing to keep them at home. From fourteen to sixteen hours' work on the farm and then do the chores, is not regarded by most young men as a cheerful prospect. Something else besides hard muscle work is required to keep them at home. Their ever active, never ceasing thoughts reach out for something, they know not what; they must have a change; excitement of some kind relieves the sensation, and the only excitement that presents itself is that of a city life. Sad mistake, but nevertheless it is true. What is being done in the majority of homes to keep the youth there? Beyond a monthly or a weekly agricultural



paper and the village news, there is the family Bible, a copy of "The History of the World," two hundred pages covering the whole period of time from the creation to the present, possibly a "Life of Lincoln," and a copy or two of agricultural or patent office reports, books all well enough in their way, but hardly calculated to develop a high order of intellectual ability. You might as well try to feed a hungry starveling upon the odors that arise from the cooking of a savory meal, as to feed the mind upon such works as are ordinarily peddled about the country.

The young people read among selected paragraphs in the weekly papers, that bones were found embedded a hundred feet beneath the surface in the solid rocks, that remains of immense animals and fish, and trees and plants, and all sorts of things are to be found in caves, and some how or other the age of the world, by some process or other may be told by these things, they read snatches about Huxley and Darwin, about evolution and selection, about Tyndall and Glaciers, and Proctor and the stars, about Schlieman finding ancient cities sixty feet below the surface, and the bits that are thus read bewilder the mind, disgust the intellect, and determine the boy, if he has a spark of resolution, to know more of these things or die in the attempt, and almost nine out of ten fail to accomplish their purpose. The place for them to learn all about these things is at home, and a few dollars annually expended in a judicious manner upon works treating upon these and kindred subjects will do much to make the boys comfortable and contented, and by so doing, they enter upon that course which is almost certain to fit them for any position to which they may be called. We know the boys will leave their homes, we know that they can not all be kept there. Canvass the list of the best minds in the country at the present time and you will find that the majority began life upon the farm, our inventors, and skilled artisans, our philosophers and teachers, our professors and lawyers, our doctors, and a whole list of thinkers of all kinds came from the farm, and if you take pains to ask them why it was they left the farm, they will tell you it was because they were in pursuit of knowledge, and that translated means, that proper mental food could not be obtained at home.

It would be a sorry day indeed for our various professions if the farmers' boys did not leave home. We want their health and strength and native keenness to infuse new life into the ranks of the



various departments of science, art and literature; we want them to increase the number of those who are endeavoring in any way to better the condition of mankind. We want them to carry on the work begun by those who have led the van. We want and must have the farmers boys to fill up the gaps made yearly in the ranks of the mercantile and scientific world, and when they come we want to come with minds trained to think. We want sound minds in sound bodies, then shall the world be better for their having lived in it, and you who have been instrumental in thus preparing them shall in no wise lose your reward.

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## CENTRAL WISCONSIN.

BY R. J. HARNEY.

In complying with the request to write an article descriptive of central Wisconsin, I must premise by the statement that one of the objects of such a paper is to afford the reader abroad some additional knowledge of the general physical characteristics of the country.

By an examination of the map of Wisconsin, it will be seen, that the Wisconsin, and upper and lower Fox rivers, form a water-line through the entire breadth of the state; whose main direction is nearly northeast from the mouth of the Wisconsin, on the Mississippi, to that of the lower Fox at Green Bay. This line is the dividing point between two great districts of very distinct physical features. The territory lying south of this river-line, comprises the great rich prairie and opening district of the state; which stretches from Winnebago county to its southern and western limits. This vast tract, with the exception of the strip of timbered land in the counties bordering lake Michigan, constitutes the northeastern section of that great agricultural empire of fertile prairie and openings which extends to the south and west, for distances that include whole states in their vast limitations; and presenting in almost one continuous body, a tract of agricultural country, whose territorial immensity and fertility is unparalleled in the wide world. That portion of it included in the limits of the state of Wisconsin is more diversified with openings and detached bodies of timber; and con-

sequently does not present those great monotonous stretches of level prairie which largely abound in the more southern portions of the district. The face of this prairie and opening country of Wisconsin is indescribably charming in its picturesque beauty of commingled prairie, woodland, lakes and rivers; forming vast rural landscapes of the most exquisite loveliness. Here are lakes rivaling the finest in the world, with handsome sloping banks rising in the most graceful undulations.

The rolling prairie, in a succession of smoothly rounded ridges, stretching away as far as the eye can reach, dotted with picturesque openings, and bordered with the dense foliage of the more heavily wooded slopes, affording views whose distant vistas fade into a perspective that resembles some enchanting mirage of wooded hills and grassy lawns, with glimpses of water flecking the whole scene in artistic lights and shadows. But in all this magnificent country there is no tract that can surpass, and but few that can equal, that embraced in the counties of Winnebago, Green Lake and western Fond du Lac. These now present one vast expanse of highly cultivated farms, with farm houses that in many instances are elegant rural villas; spacious barns and good fences, giving every evidence of the wealth and thrift of their occupants.

In Green Lake and Winnebago, the beautiful water scenery is an especial feature, which gives additional charms to the contrasting varieties of prairie and woodland. These large bodies of water modify the heat of summer, and purify the air, which is delightfully exhilarating and healthful. These lakes, and rivers too, form a great water course through the heart of the country, which is navigated by steamers, and upon whose banks have arisen some of the chief cities of the state. Here, then, is a country of the richest fertility of soil, with a healthful climate, in which malarial diseases are almost unknown, with pure air and an abundant supply of the best of water; while every portion of it is in close proximity to business centers, and abounding in great physical resources of agriculture and manufacture. Immediately adjoining this country is the heavily "timbered" region, or northeastern Wisconsin, traversed by navigable streams, and possessing the greatest water power on the continent, with a capacity, at a number of points, for miles of mills and factories, at one point on the lower Fox the capacity being 115,000 horse power. This "timbered" country of northeastern

Wisconsin is also a fine agricultural district, in addition to its great manufacturing resources. The thirty large flouring and paper mills, many of them mammoth establishments, in Neenah and Appleton, and the extensive iron works and manufactories of wooden ware, at various points on the river, already give evidence of the giant proportions of its manufacturing capacity, but which is yet in the very infancy of its development. The country, collectively, constitutes the Fox River Valley — the upper Fox, prairie and openings of the richest fertility; the lower, hardwood timber lands, with a good strong clay soil, while to the northwest is the belt of sandy district, which terminates in the great forest lying beyond. The country to the north and west of the upper Fox, with the exception of a portion of Winnebago county, is one distinctively different in its physical features to that lying to the south and east, as stated in the beginning of this article.

The vast prairie country to the southwest has its northeast boundary in the beautiful valley of the upper Fox, in which the face of the country, the soil and general features, are similar to those of the best parts of the southern portion of the state, with the additional feature of the numerous bodies of navigable waters. A short distance to the north, after crossing the Fox, the character of the country changes, and the region called Northern Wisconsin here has its beginning. The soil changes from the rich black loam of the prairie, and clay of the wooded land, into a sandy soil, which very generally prevails in Waushara and northern Marquette counties, and the southern half of Portage and Waupaca, with variable degrees of fertility. After crossing the belt of open sandy country, the pine and hard wood forests of northern Wisconsin are reached. The vast region lying beyond the Fox valley, and extending north to the shore of Lake Superior, is one of great variety of soil, resources and face of country, embracing small sandy plains, handsome openings of fair fertility, extensive cranberry marshes, grass lands, cedar and tamarack swamps, pine lands, and rough, rocky districts, and mineral lands. It is well watered by innumerable lakes and rivers. In northern Lincoln county, in one tract, embracing about two thousand square miles, over one-fourth of the surface is water, consisting of more than a hundred beautiful lakes of crystal transparency, dotting the surface of the country like the islands of the Grecian archipelago, that of the Mediterranean sea.

There are also in northern Wisconsin large tracts of the very finest maple-sugar land, comprising nearly whole townships in a body, with a rich, warm, black soil; as fine farming land as can be found in the west. There is a wide belt of this maple land mixed with other hardwood timber, and an occasional patch of pine, extending through Oconto, Shawano and Marathon counties; some townships are already well settled, and large tracts in a good state of cultivation. This whole tract is well supplied with the purest of running water, spring brooks, rivers, and, in many locations, beautiful lakes.

The country to the north of this body is more broken, rough, and rocky, and constitutes a portion of the great mineral tract which extends to Lake Superior. It will be seen, therefore, that this region has a great variety of natural resources in its timber materials, mineral deposits, agricultural lands, navigable streams and water-powers.

The Wolf river and its large tributaries, flowing from this region empties into the upper Fox, and is navigable for one hundred and fifty miles or more, thus giving the Fox river valley country, water communication and easy accessibility to its vast material resources.

It is this conjunction of the respective natural elements of three distinct types of country, which constitutes the great manufacturing and business capacity of the Fox River Valley; where nature with the most prodigal hand has scattered the richest elements of productive wealth, and it is this which makes the beautiful country on the line of these watercourses, a populous thoroughfare, on which have sprung up thriving cities, the busy centers of modern enterprise and manufacturing activity.

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## WHAT THE NATURAL SCIENCES DO FOR THE FARMER.

BY PROF. WOOD, OF THE OSHKOSH HIGH SCHOOL.

I once knew an old gentleman who had a passion for collecting rare and ancient coins. After getting one, he would look at it, admire it, rejoice in its possession, and then put it into a large



basket, along with all those previously obtained. He never classified or arranged them in any way, and he could never find one for reference, without turning over the whole basketful. They were, consequently, of no practical use to him; and when he died, the executors of his estate, not knowing their value, sold them as old copper, and so the collection was lost to everyone.

This figures, to my mind, the kind of knowledge possessed by multitudes of men. They gather up a rare fact, here and there, think it over, and put it away with their other facts, in the storehouse of oblivion, unclassified, disconnected, not available for use, to them or others.

Now, Science is knowledge; but it is more, it is knowledge systematized. It is the aggregate experience of observing men of all time, collected by careful and patient labor, not as a mass of isolated and disconnected facts, crude theories and ingenious speculations; but facts classified, and brought down to demonstrated principles and laws. The natural sciences are made up of all that is known and proved concerning the workings of nature, in her various departments thus classified and arranged. To thus observe, to sift the false from the true, to bring the heterogeneous materials into order, to deduce therefrom principles of universal value, and to apply these principles to the various concerns of life, has tasked the genius of Aristotle, Humboldt, Newton, Galileo, Davy, Franklin, and a host of the grandest men of all time. Our subject is, "What these sciences do for the farmer." Let us consider, briefly, what they do for him, mentally and economically.

In the first place, no one can diligently and earnestly study the works of such men, without catching something of the zeal and enthusiasm that inspired them, without becoming infected more or less with the desire of searching under the exterior of things for their hidden meaning, without forming the habit of observing likenesses and differences. and thus generalizing, classifying, learning to think for himself. And how those things must enlarge, and deepen and strengthen a man's mind? Think for a moment what it is to form such habits of thought. How many farmers, as well as others, there are, who never, by reading and study, come into contact with great minds, who never observe a new fact or principle, who take everything as they found it, without independent thought, whose little knowledge is loose, disconnected and almost



valueless, who are totally unable to foretell events from causes, or trace causes from events, and who, born and raised in the midst of nature's beauties and glories, catch no glimpse of either. What a change, if such a man could have his mind thus enlarged. How much more valuable he would be to himself and to others. How many things he would know that would be useful and enjoyable. How many of the rainy and wintry days that are now spent in idleness could he pass in happy thought and delightful research. How many of the phenomena of nature, that are now dim mysteries would be sources of delight and joy. But besides this effect of enlarging the mind and giving the man a broader view of things in general, there is the additional personal effect of storing him with abundance of practical knowledge, available for everyday use. People who have not become acquainted with the sciences are apt to misunderstand and misapprehend them. They think, for instance, that the study of botany is the mere learning of the names of a multitude of flowers. But this is only an incident. Botany is the science that treats of the methods of classifying plants, of their laws of growth, development and reproduction, and has within its scope the consideration of all questions relating to their geographical distribution, their medicinal, mechanical and manufacturing value, their uses for food and clothing, the climates, soils and treatment best adapted to them, and the means of producing better and more useful varieties. Can anything be of more practical benefit to the farmer than such knowledge? Zoology, too, is not a mere knowledge of the names and appearance of animals. It includes the investigation into their habits and modes of life, the better ways of developing growth, the means of obtaining and maintaining better kinds, the ability of distinguishing between those birds, reptiles and insects that are noxious and those that are of benefit to the tiller of the soil. To-day the vines in many parts of Europe are dying of a rapidly spreading disease. No one understood what it was until an entomologist discovered that it was caused by swarms of a microscopic insect, the "phylloxera." Knowing the cause is the first step toward discovering the remedy; and the phylloxera will continue its ravages, laying whole districts of sunny France and Italy to waste, and reducing the inhabitants to beggary and starvation, until some scientific man shall discover and announce the remedy. Tyndall says that a dozen years ago a disease

came upon the silk worm in France, and spread till it very nearly ruined the silk husbandry of that country. Pasteur, the leading chemist of France, or, perhaps, of the world, studied this plague until he found that it was caused by a minute worm, a parasite upon the silkworm. Then he studied the nature of the worm, and discovered at what stage of its existence it could be destroyed, and under his directions the disease was stamped out, and thus was restored a vast department of agriculture, manufactures and commerce. Is such knowledge of no practical value to the farmer? Is it not inestimable?

Chemistry teaches of the elements of the rocks and soils, and of plants as well. It shows what are the proper constituents to add to various kinds of soils in order to obtain bountiful returns. What the unscientific farmer can learn only by many careful and expensive, and perhaps vain experiments, may be ascertained by the chemist with little trouble and with certainty. If the farmer knows before trial that his farm is not adapted to a certain crop, does it not save him the labor and expense of a useless attempt? Or if he finds that by the application of some cheap and easily obtainable material he can double his returns, is that not valuable? To give an illustration: There are certain soils that raise wheat of an excellent quality, with full berry and an abundant measure, but on which the grain lodges so badly as to make it almost valueless. Now this probably results from a lack of quartz or of potash in the soil. The stalks of grain need abundance of quartz to give them strength. But they can obtain it only when it is dissolved, and nothing in the soil except potash or soda can dissolve it. Sand is almost wholly quartz, and where there is sand in the soil and the grain lodges, it is because of a lack of potash. In vegetable mold there is abundance of potash, and frequently too little sand. The chemist could tell in a little time whether sand or ashes were needed, and by an application of one of these inexpensive substances the soil could be made to return a good crop in a good condition. This only illustrates the fact that a farmer who has learned only disconnected facts, and has no knowledge of principles, is helpless when brought up to face something new in his experience. He must resort to haphazard experiments, which almost necessarily result in failure. How many a farmer has bought a highly recommended fertilizer, and met only with disappointment. It is of no

use to decry fertilizers. That was probably good enough, but it was not the thing needed on his land.

But I have not the time, nor you the patience, to take a detailed view of what *all* the sciences *do* for the farmer. I have tried to illustrate, briefly, the special advantages of one or two. But over and beyond the benefits that accrue to the farmer, simply *as* a farmer, there are those that come to him as a *man*, along with all other men. For none of us live an isolated life; the prosperity of one class is so closely interwoven with the prosperity of all classes, that what affects the merchant, the laborer, the sailor, the student, more or less affects the farmer; and, on the other hand, his prosperity is the prosperity of us all. And what have the natural sciences done for man? Ask astronomy, the mother of them all! And navigation and commerce will rise and declare that without astronomy they could not exist. Ask geography, and she will tell you that the development of the fairest portions of the earth has followed upon the knowledge of the physical features, the climate and the commercial advantages of new regions. Without astronomy and geography, Columbus would never have dreamed of his immortal discoveries, and America would to-day be the abode of savage beasts and savage men. Ask chemistry, and she will tell you of better kinds of food, and better ways of preparing it, of methods of burning coal, of making illuminating gas, of smelting and working the refractory iron, of extracting the precious metals from the primal rock. Ask physics; she will point to the primitive man, living in caves, subsisting on roots, berries, and such animals as he could capture with his hands, and then to the man who has learned to build houses, to establish manufactories, to erect bridges, to endow schools, to make firearms, to construct clocks and watches, to drive the locomotive, and to tame the lightnings of Heaven and send them on his daily errands. We burn no lamp, or candle, or gas, we pump no water, we weave no carpet, we tan no leather, we make no steel, we take no photograph, we float no ship, we guide no wagon, we use no pencil, or pen, or ink, we print no books, we coin no money, without applying the principles of natural science. These are a few of the things that science is doing for the farmer and the world.

I will close by urging upon your attention the pressing need of more and better and more practical means of giving at least the

rudiments of a knowledge of the sciences in all our schools, and of giving earnest encouragement and support to agricultural colleges, and all colleges and schools where the natural sciences are taught.

Not that I think, by any means, that every farmer's boy should go to college, even an agricultural college. I know, as well as you know, that the average boy will never return to the farm, after graduation. But those who do go will learn the sciences in their application to agriculture; they will be especially interested in and identified with it; their investigations and discoveries will naturally be connected with it, and, by their scientific methods and research, they will tend to elevate and improve it. But I would urge you to give all your boys a taste for science; a disposition toward method and observation; and some of the culture that comes from the careful study of nature. By all means, provide for them books on botany and natural history. There are such books, written even for the very young, such as Dr. Hooker's "Books of Nature," Jacob Abbott's "Science for the Young," etc. Let them read these during the winter evenings, and they will be so trained as to have an intelligent appreciation of their work, and to make of it a delight, instead of drudgery. Until such time as farmers, generally, do give their sons a taste of something more than the humdrum monotony of uneducated boyhood in the country, they can expect no other result than to see them, one after another, turn their backs upon the peace and plenty of the old farm, to mingle with the dwellers in cities, in the harassing, perplexing, health-destroying, soul-wearing occupations in which so many of them are compelled to engage.

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## DRAINAGE.

BY O. COOK, OSHKOSH.

Among the many subjects discussed very ably before this association for the benefit and information of the agriculturist, that of drainage is one of great importance. It is a subject that should receive more attention than has yet been bestowed upon it. Now that the lands in this section are nearly all under cultivation and the farms generally improved, a low, wet or swampy portion on a



farm or in a field stands out more prominently, and greatly mars the otherwise attractive landscape of the neighborhood. And when land is worth from twenty to fifty dollars per acre, if instead of a farmer buying a few more acres to add to his labor and taxes, he would underdrain the low, wet, unhealthy portion of his own farm that he plows and plants yearly with very little return in the item of crops for his labor, he would not only get a better interest upon the money invested, but would increase the beauty and attractiveness of his homestead.

The art of drainage is of especial interest in its application to the reclaiming of wet lands and the improvement of those through which the water that falls upon them in rains or is brought by subterranean channels does not find a ready exit. The importance of thorough or partial drainage of lands in this section of Wisconsin can be appreciated by a tour through the country at any time after vegetation has started in the spring; entire fields of wheat and corn can be seen having a cold, sickly appearance, while others of rolling or uneven surface will show grain of rank growth, and a dark rich green color upon the high and well drained land, while the crops upon the lower and undrained portions of the field will look as though another season would be necessary to complete their growth. This uneven condition in the growth of crops can be reversed by proper drainage; not by reducing the thrifty growth to the condition of the sickly, but by draining the low, wet portions, thereby warming up the soil which has been for ages the receptacle of the washings of the adjacent higher grounds, until the vegetation on these lands will be as much in advance of that on the higher portions as it formerly was below them.

Wet lands are well known to be unfavorable to the production of large crops; the soils that retain moisture are correctly described as cold, while more porous soils of a sandy nature are called warm. The former are chilled by the evaporation continually going on, while the latter are warmed below by the rainwater which percolates through from the surface, and is heated by the direct action of the sun's rays.

It has been proven by experiments — of Mr. Parks of Lancashire — that by giving free passage to the water through a cold, clayey soil by thorough drainage, its temperature at the depth of seven inches may be raised ten degrees above that of undrained



land of the same quality adjoining, thus producing the effect of a warmer climate, and in the spring the soil is sooner prepared for cultivation, and may be in condition for plowing and planting two weeks earlier than adjacent lands of similar quality in other respects would admit of the passage of teams for cultivating.

The great variety of fertilizing substances which are continually ascending from the earth's surface are brought back by the falling rains; if the land is wet and clayey the falling rain will flow off upon the surface, carrying along not only the fertilizing qualities contained in the rain, but the best substance from the soil; but if the water is suffered to percolate through the soil, it yields up its burden precisely where the roots of the plants are ready to seize upon it. The rain is filtered through the soil and emerges from the drains a stream of crystal purity, having deposited all the fertilizing qualities, where they are easily absorbed by the growing plants.

While frequent showers of rain are a great benefit to lands through which they find a ready passage, their retention impairs in various ways the fertility of the soil. It prevents the pulverization of the earth by the plow and harrow, and the circulation of air to the roots of the plants.

It is a fact fully established by experience that undrained lands are more liable to suffer from drought than those thoroughly drained. The former in a dry time become baked and compact and do not readily absorb moisture from the atmosphere; but a well pulverized and open soil receives into its pores and absorbs like a sponge the dew and aqueous vapor in the air.

The tile drains are also continually acting as condensers, the warm air passes into the tile where, coming in contact with their cool surface it is cooled, and gives off its surplus moisture, which is absorbed by the tile and passed into the soil above them.

That this theory is correct can be proven by taking a glass bottle, and after placing it in the sun until it becomes heated and is filled with hot air, we cork it up tight and place it under the ground or in any cool place, for an hour, or until it becomes quite cold, when we will find the whole inside surface covered with moisture, condensed from the hot air in which it was held in invisible vapor. Open trenches may convey away the surface water, but do not reach the cold stagnating repositories beneath the soil, which check that

free circulation of fluids which is as essential to the health of vegetable bodies as that of the air to animals. Drains should be laid from two and a half to four feet deep; the deeper tile are laid the greater distance they will drain each side of them, and are less liable to become obstructed by frost; great care should be taken to have the descent gradual and uniform, leaving no depression in which sediment might accumulate to obstruct the drainage. The least fall admitted by most authorities in the usual sized drains is not less than one in six hundred; but such a gentle descent is hardly advisable where it is possible to obtain more; one in two hundred is the least fall that ought to be adopted where it is possible to procure that amount. The distance between the drains should be determined by the nature of the soil through which they pass; if the subsoil is clayey, they should be laid much nearer than is necessary in a porous soil. In some cases a subterranean spring may be tapped and the water carried off by a single drain, that formerly kept the soil of an entire field so saturated that it was unfit for cultivation.

The size of the tile used should be determined by the length of the drain and the amount of water they are expected to carry off. They should be large enough to carry off the water without being entirely filled, thereby causing the water to flow outward through the joints into the soil around them. Drain tiles have been made in a great variety of forms, but round tile are now admitted to be superior to any other shape. The bottom of the ditches can be more easily shaped to receive them, and the joints can be laid closer and in a more uniform manner than tile made in any other form. Having given a rough outline of the necessity, advantages and system of underdraining, I will close by repeating some of the advantages claimed by men who have studied and adopted this system of land improvement: It lengthens the season of labor and vegetation; it promotes fine tilth by rendering the soil more friable; it diminishes surface washing; it lessens the chance of winter killing; weeds are more easily destroyed, because the soil does not cling in a mass to their roots when torn up by the hand or plow; it diminishes evaporation, and thus raises the temperature of the soil; it promotes the absorption of fertilizing material from the rain and air; it increases the yield from one fourth to the whole of the crop, because portions of the land were formerly too wet or under water until it

was too late to put in seed. And it beautifies the home by obliterating and turning into a most verdant condition, the waste places that were formerly a blot upon the otherwise fair farm; increasing contentment in the family, and thereby lessening the desire which is becoming too common, to dispose of the old homestead and enter into some uncertain business in the neighboring city or village.

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### BETTER AND HAPPIER HOMES FOR OUR FARMERS.

BY J. M. SMITH, OF GREEN BAY.

Last fall, while conversing with some friends and visitors at my home, about farming and farmers in general, a young lady from Illinois, who was one of the company, said, in a very determined tone, "I will never marry a farmer." How is that? said I. We think farmers are, or ought to be, at least as good, if not a little better than almost any other class. She replied, "Well, it means a life of slavish toil, and hard labor, a life almost excluded from society, and shut up, too, in a home where there are but few things more than the mere necessities of life; there is no chance for a woman to be more than a mere drudge or slave of toil, and I will never marry a farmer." This young lady is a native of Illinois; she has lived there all her life up to last October. She has taught school among the farmers of those magnificent prairies, and thinks she knows something of how they live. I scarcely know when I have been more impressed by any casual remarks in mixed company than with those of this young lady, and also her determined manner as she uttered them.

I could not but ask myself the question over and again, Are the farmers' homes so much worse than other people's, that they are to be shunned by educated and refined young ladies? If this is so, surely a reform in this respect is sadly needed. Shortly after the conversation above alluded to occurred, wife and myself started off on a somewhat extended pleasure excursion. We traveled some hundreds of miles in the great state of Illinois, as well as through many other states. I kept in mind this young lady's remark. I saw many pleasant and comfortable looking homes, many beautiful ones; but I must confess that I saw many that were neither pleas-

ant nor comfortable, that is if we can judge from outside appearances. I saw very many that made me wish for more pleasant outward surroundings for our farmers' homes. And why shall we not have them? Why do we not have them? I know very well the answer that would come from many a farmer, "Oh, I have not the money nor the time to spend in adorning my house and yard;" and in many cases the additional remark would be made, "and besides I intend to sell out the first chance I get, and move somewhere else."

What constitutes a home? I know that this is a very indefinite question, and would receive an almost infinite variety of answers; yet some farmers' homes are about as follows: A miserable shell of a house, with not a tree nor a bush about it; nothing to protect it from the burning summer sun, or the wintry blast. It has no pleasant yard or garden about its premises. No flowers bloom on the place, unless perchance they are struggling up with the weeds in the fields, and along the fences. Perhaps the fields yield a fair harvest, and perhaps not. If the crops are good, the farmer accepts them as something that he is fully entitled to have. If they, or the most of them, fail, as they are apt to do, he quietly lays all the blame upon the bad season, which, by the way, is only a very impolite way of accusing Providence of not doing what, in a majority of cases, the man ought to have done himself in order to secure good crops. He is generally indolent and ignorant, and often selfish and self-conceited. If you enter his house, it is homeless, cheerless, and comfortless. It is the place where he generally eats his meals, and sleeps; a place where he spends his leisure hours, provided he has no other place to go. His wife goes her daily round of hard labor, cheerless, dispirited, and discouraged. If she had ever looked for a nice and comfortable home in the future, she has long since given it up; and if she has hope or courage left, it is that her children may escape at least some of the hardships that have fallen to her lot. She rarely goes from home, and never upon an extended journey. She sees almost nothing of the world, and knows but little more of it than she sees, as there are neither books nor papers provided for her home, and hence she cannot read if she would. The children grow up with the idea instilled into them from infancy, that the farmer's life is one of ceaseless toil, and that poorly paid, of comfortless homes, of an uneducated and unculti-



vated manhood, and a premature old age. If they have the energy and spirit of true Americans, they are restless and uneasy, dissatisfied and discontented with their home, and finally leave it in search of something better, or at least different from what is to them, the ideal of a farmer's life. Is it any wonder they leave? Is it any wonder the daughters declare their intention never to marry farmers? If my young lady visitor had ever seen such homes, is it any wonder that she declared that she would never marry a farmer?

And yet it is useless to deny the fact, that we have just such homes, or places where homes ought to be, among our farmers. I can find them in my county, I know they exist in many others, and I presume they do in every county in the state. How to reach them, or in what way to go to work to get them to try to improve their condition, is with me an unsolved problem. Not long since one of my sons had occasion to call at the house of one of this class of farmers. He owned forty acres of land in the forest. He had cleared and was cultivating seven acres of it. Not a book nor a paper was to be seen about the house. My son asked him why he did not clear up more of his land and cultivate it. "Well," said he, "I was afraid I should get out of wood one of these days, and I thought I would just keep the rest of it for firewood." "Well, why do you not have some books and papers about your house to read?" "Oh, I aint got no time to read, and besides, books and papers aint no 'count, nohow." Such men never attend agricultural fairs or conventions, or read an account of their proceedings, nor take agricultural papers. They generally are constitutional grumblers at their lot in life, while in fact they are only the victims of their own indolence, and ignorant prejudices, as well as their self conceited vanity, all of which help to lessen the comforts of their home, and degrade their profession in the estimation of the intelligent and educated throughout our whole country. They are perhaps the most difficult class to reach, from the fact that they rarely mingle with the educated and refined men in our profession, and manifest but little desire to improve either their homes or themselves. And anything done among this class by those of us who have had better educations, and better advantages in general, must be somewhat of the nature of what our religious societies term "home missionary work." Gentlemen, let us not neglect to do this as far as it lies within our power. We may thereby make some homes more happy



and cheerful, and possibly lay the foundation for many happy ones in the future.

Let us now turn for a brief space to a class of homes of a far different order. The owners of them are generally men of means; some of them men of wealth; all of them men of intelligence, and some of them well educated. They are men who attend conventions and are among our most enterprising farmers. They are nearly, or quite, all of them men who are in reality gradually improving their farms, and also improving in their financial condition. Many of them are first-rate business men, such men indeed as their section of country could ill afford to spare. And yet how often are the homes of this class of farmers far from what they ought to be, and in reality might be. The wife, instead of having her cares lessened and her labor lightened by their continued prosperity, actually has them increased. There is a larger dairy to care for; there are more hired men to board; there are larger washings, ironings, bakings, etc., to be done, and perhaps a larger proportion of it to be done by her own hands. Good help in the house, and plenty of it, is often difficult to get, and the weary wife worries through the days and weeks, she scarcely knows how. One thing, however, she does know, viz.: that when bedtime comes, she is too tired to be company for either her children or her friends. She cannot even be society for her husband, but is only too glad to lay her weary head upon her pillow, and rest herself as best she can for the labors of the following day. The library, if there is one, is small and poorly adapted to her tastes and wants. The papers and magazines are not selected with any particular reference to her tastes, and hence, if she had the time to read she could take but comparatively little interest in doing so. She seldom rides or journeys with her husband, because her household duties confine her at home. If she has a bed of flowers, it is neglected and finally overrun with weeds because she cannot find time to attend to it, and the hired men are all too busy to fool away their time about a little insignificant bed of pansies and other worthless things like them.

Her husband, upon the other hand, is almost constantly mingling with other men of business and education. With a quick and active mind, he seizes hold of new ideas and revolves and elevates them in his own thoughts until they are perfectly familiar to him. He is posted in the improved methods of farming, and ready to

adopt such of them as are adapted to him in his situation and circumstances. He is posted in regard to the improved breeds of stock, and selects such as he considers best for him. As the years roll away he becomes a strong man in general information, and perhaps a very useful one to his whole community. He is constantly growing away from his wife, and none knows it as quickly, or feels it as keenly, as she does. Years ago when they stood side by side, at the commencement of life's journey, she was his equal, not only morally but intellectually, and in some things his superior. Now it is the giant and the dwarf. Now the husband looks at his wife and wonders why they are so far apart. He knows that she was once fully his equal; why is she not so now? Whose fault is it? He has not intended to be unkind or untrue to her. Nay, more, he has always truly loved her, and does so still. But she is not the social and intellectual equal to him that she once was, and she cannot possibly make herself such. She cannot make his home as happy as it might be, and herself his most desirable companion and adviser, for the simple reason that she has not had the educational advantages that have been constantly pouring in upon him in his every day life; the equivalent of which he should have provided for her in other ways, instead of allowing her to move along in her daily treadmill of household cares and labors. He is almost alone even in his own home. If he has been neglectful in the little matters and comforts that he might and ought to see provided for his home, the thousand things that are really necessary to a happy home, but which I have no time to name upon this occasion, his home becomes not a home in any true sense of the term, but the headquarters of his farm and his business; and his wife the head manager of the house, and in some sense a kind of partner with him in some of his business transactions, though he never consults her, but simply tells her that he has done this, or that, or the other.

Do not think this picture overdrawn. During my recent journey east I met an acquaintance upon the cars, and while chatting together, a very prominent farmer was mentioned, one with whom we were both well acquainted. He is in many respects a man of much more than ordinary intelligence and ability. He owns a magnificent farm, and has it well improved and well stocked. He is thoroughly wide awake, and is certainly one of the best farmers of the state in which he resides. I remarked to my friend that I was sur-

prised that such a splendid farmer and such a splendid man as I considered him in many respects to be should live just as he did. "Live!" he exclaimed. "Do you call that living? They live just like their hogs." It is only justice in this case to say that the farmer had an improved breed of hogs, and that they fared well. During one of the drives that I took while east, I passed the old homestead of a man who died a few years since and left an estate valued at \$250,000, and yet it was one of the most desolate and forsaken looking places that I ever saw. Still it was but little worse than it was many years ago, when I used to pass it very often and see its owner devoting every energy of both body and soul to the one single object of getting money. And he succeeded, as his estate of one-fourth of a million indicates. But as to a happy or a comfortable home, he never knew the least thing about it; neither did his family.

What is such a life worth? You may say that this is an extreme case, and perhaps it is; but it is not the only one of the kind that I have ever seen.

Let us take another case. An old schoolmate whom I visited is a good farmer. He is much more than that. He is well informed, and, in all his business transactions, a Christian gentleman. He inherited his farm and a large fortune with it. He is liberal and generous in his dealings, and in his benevolence; himself and family, during the last year, having subscribed \$3,500 to a single object. I believe he would thoroughly scorn a mean or dishonest deed of any kind. Neither would I intimate that he does not love his wife and intend to treat her well, for I am sure he does both. Yet, when I went there, I found her in the kitchen hard at work, and assisted by an old aunt, seventy-six years of age.

And this was their daily routine. I spoke to him about it, and asked him why with his large fortune, he would still persist in such a life of manual labor for himself and all his family, when he might do so much good by employing plenty of hired help both in the house and upon the farm; and both himself and wife might employ their time to so much better advantage in teaching and training others to labor, and also enabling them to care for themselves instead of being a burden upon the community. "Well," he said, "I do not work much, and do not intend to in the future; but somehow, in the house, we do not always succeed in getting good

help, and it costs considerable and so we sometimes do without help in the house." And yet his wealth runs into the hundreds of thousands. When I arose to leave he had left the room; I bade the family good-bye, and went out and found him in the barnyard milking his cows. "Why," said I, "You told me a few moments ago that you did not work nor did not intend to in the future." "This is no work," said he, "it is only fooling a little with work." "Very well," said I, "When I get back among my friends at the West, I will tell them what the rich farmers of the East call fooling with work is, going into the barnyard and milking a whole dairy of cows with no help, and perhaps they can judge from that what you would call hard labor." He laughed heartily, we shook hands and parted.

Now, I claim, that with all my friend's good qualities, and good deeds, and they are many, still his home-life is, to a great extent, a failure. This is not so because he is too close to provide for such a one as he shall have, but perhaps from mere thoughtlessness and negligence. I rode with him in his carriage behind a splendid span of horses; yet he and his wife rarely go out upon a pleasure ride, they very seldom take a pleasure excursion together. Their home is a comfortable one, but lacks the lawns, the shrubbery, the fruits, and the flowers that should adorn such a place. The house lacks the valuable library, and the music that should be the means of improvement and recreation to every one within its walls. Both himself and his wife are too busily engaged in their daily rounds of care and manual labor, to devote the time necessary to beautify and adorn their home, or to improve their intellects and tastes by adding the many things that should combine to make such a home a miniature Garden of Eden.

But I suppose you are ready to ask: "If happy homes are neither among the rich nor the poor farmers, where shall we find them?" Well, there are some very pleasant and happy ones among each class, though we may well wish they were more plenty. It does not of necessity follow that our farmers must have wealth in order to have better as well as happier homes. No class in society is so favorably situated to have cheerful and pleasant surroundings, and at so low a price as the farmer. He is not crowded for room. A few rods of land either more or less in his front yard or in his garden makes no appreciable difference with him. He knows the for-



ests, and the shade trees suitable for his place. He can select and set them with his own hands. We all know that with us there are a few kinds of forest trees that are easily obtained and flourish well almost everywhere; and that when grown they are among the most beautiful trees upon the American continent. I refer of course to the Spreading Elm, and the Maples, both hard and soft. And then the smaller shrubbery is so easy to be obtained, and it adds so much to the beauty as well as the comfort of a home, that I am sometimes surprised that any farmer will content himself with none at all. Even a few bushes of the common lilac and snow-ball would make a vast improvement; and surely no man in the northwest who styles himself a farmer should be unable to make and to keep in condition a nice yard of grass about his house. A bed of flowers, be they ever so common and be it ever so small, is an absolute necessity. Perhaps you will not care for it yourself for the first year or two, but after that you would be almost as unwilling to do without them as any member of your family. The garden should be a place of beauty as well as of profit; not simply a spot of ground where there are a few early potatoes and corn and possibly a few other things planted, and after being hoed once or twice, left to struggle as best they can with an enormous growth of weeds.

A number of years since, I visited a friend who owned one of the most beautiful as well as one of the best farms of its size that I ever saw. I was telling him about a very large crop of melons that I then had nearly or quite ready for market. He said he did not see why his vines did not grow; there were no weeds among the hills, as he had them all pulled up only a few days since, and yet they did not grow, and he should have no melons. I knew that he had a beautiful spot for a garden, and that it was very rich, and I walked out with him to see if I could get any information as to the cause of failure. Well, there were his vines, feeble and puny; each hill having a space from two to three feet in diameter, from which the weeds had evidently been pulled up within the last ten days. The balance of the ground was covered with a growth of weeds from four to six feet in height, and as thick as they could grow, and the ground almost as hard as the road. And yet he wondered why his vines did not grow. His other garden crops were in a similar condition; and yet I scarcely know of any persons who enjoyed the products of a good garden better than his family and himself.



Now why is this? Why is it that so many of our farmers fail to have anything that by any stretch of imagination can be called a good garden, or a pleasant and comfortable yard about their homes? I can account for it only in one way, and that is, by supposing they have never tried either one sufficiently to know their real value and comfort. It takes but a little spot of ground, if well cared for, to furnish an ordinary family not only with a full supply of strawberries during the berry season, but to give a good surplus for canning for winter use. Forty quarts per square rod is not a difficult crop to raise. Then come the raspberries and currants, favorites with almost every one. Before these are fairly gone come the blackberries. While we are yet treating ourselves to this fruit, comes the grape, and completes the list of our small fruits, and also completes the season.

Is there a farmer here — is there one in this state, who owns even twenty acres of fair tillable land, that cannot have these fruits in abundance? I do not believe there is one. Do not say that you have no skill in laying out your grounds, and are not able to employ a landscape gardener. I have no word to say against landscape gardening as a profession; still, they are by no means one of the absolute necessities to the average farmer. I never took the first lesson in landscape gardening, still, I know enough to drain my land, and then lay it out in such a manner as will make it very convenient to work upon, and to get about upon, without injuring the growing crops. I know enough to manure highly, and then cultivate in such manner as to make very large crops grow year after year, with but very few exceptions.

My wife is as ignorant in her department as I am in mine; and yet, when friends come and admire the wondrous beauty of her flower beds, and as they pick here and there a flower of almost marvelous size and brilliancy, I never hear them complain that the beds are not laid out after the most approved pattern, or the latest style. The flowers are there; there is no charge for looking at them; and when we are too tired to work any more, too tired to read, too tired to sing, we can still go out and see the flowers. Gentlemen, let me urge upon you not only the real necessity, but but the pleasure of making home more pleasant and attractive. You will notice that I have asked for nothing that is beyond the reach of the common farmer. I have purposely avoided recommending any large outlay of money.

A home may be made exceedingly attractive with but a small outlay of money, though it will take some time and labor. Many years since, a young lady school-mate of mine, a few years older than myself, married a young man, and moved to the forests of Michigan. They settled in a dense oak forest, and for years there was no house within miles of them. Here they commenced, as thousands had done before them, and thousands have done since, to hew out a home and a competence. After years of hard labor, a pleasant farm spread itself out before them. Their home was a plain, though comfortable log house. Outside of it grew shrubbery, fruits and flowers. A magnificent Prairie Rose had covered a portion of the logs from view, and was trying to cover the roof. Inside was a small library of select works. Papers and magazines were always there. There was not a single article of expensive furniture about the house, though there were the thousand and one little things that only the loving wife and mother's hands can so arrange as to make everything seem just as it should be. One day a friend came in. He was the owner of a very large and finely furnished home, one of the best in the county. After chatting a minute or two, he threw himself down upon a lounge in the room, and said, "Well, Sarah, there is more pure home in this house, than in any place that I ever was inside of in my life." A family of children grew up there; but the sons were in no great hurry to leave their home; the daughters did not promise themselves that they would never marry farmers; and now as old age is creeping on and claiming this happy pair for its own, the loving hands of sons and daughters, and grandchildren, are clustered about them to shield and protect them from every earthly ill, as far as is within their power. They are not rich. The world will never hear of any great deeds of theirs. But a happy home is theirs, an intelligent and a happy family has grown up about them, and now a happy old age is theirs. Is not such a home, humble though it be, worth having? Is not such a life worth living? A friend was describing a visit that he had made among some friends at a rural home. I may not give the exact words, but they were substantially as follows: "The house was not expensively nor extravagantly furnished. There was a small library, and plenty of papers and magazines seemed to be lying about loose everywhere. There was a musical instrument and plenty of music, as the family were

nearly all singers. The house was not a large nor an expensive one, yet it was one of the biggest homes that I ever got into in my life." Gentlemen, there are some, yes, many pleasant and beautiful homes among the farmers. I wish I could honestly say that they were the rule, and the lonely, lonesome, desolate house, standing like a sentinel, and seeming to say, "I am comfortless and homeless, come not near me," the rare exception.

We of the northwest occupy the best portion of this continent. It may well be doubted whether there is another territory of equal size upon this globe that combines so many, and such favorable advantages for farmers as these northwestern states. And shall we not make our homes as attractive as our country is rich and beautiful. Let us not fail to do our share to the very best of our ability. If we but make our homes what they might be, what they should be, and what we really can make them, heaven would be much nearer earth, much nearer our homes than it is to-day. The millennial morn will dawn much sooner, and its glories will linger much longer among beautiful and happy homes than it will where families only meet together to eat and sleep and be sheltered from the cold and the storm.

Let us make our homes, humble though they may be, pleasant and attractive. Let us make them cheerful and happy. It can be done without much money, but it will require that husband and wife shall work in harmony, and work together. If we but do this, I have no hesitation in saying that the time will soon come when the complaint would cease to go forth that the sons are all leaving the farms for other business. We should no longer hear educated and refined young ladies declare their intentions never to marry farmers.

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## FRUIT-GROWING IN FOX RIVER VALLEY.

BY J. C. PLUMB, MILTON, WIS.

The valley of the Fox and its tributaries has been to me a source of much study for the last six years, and knowing as I well do the reverses which have fallen to the fruit-growers of the greater part of this region of the state, I have endeavored to solve the

problem of practical fruit growing here, and by studying the natural conditions of climate and soil, to evolve some rules for successful fruit-tree growing in this region.

To this end I also bespeak your candid and careful observation of the facts I may present, and if I may but aid in clearing up doubts, and help to establish fruit-growing on a reliable basis in this great valley, I shall feel well paid for my labor in this direction.

I have long been of the opinion that other than climatic causes lay at the foundation of the repeated failures of the fruit trees in this region, for up to latitude  $44\frac{1}{2}$  on the eastern side of this valley and nearly the same latitude in the midst of this region, there are marked instances of success with our ordinary hardy varieties of apple and pear.

And on the Mississippi bluff region up to forty-five degrees, with an average winter temperature six degrees colder, and an average summer temperature four degrees warmer than at Green Bay, the hardy apples are a success beyond any doubt. So I came to the conclusion that some other cause than that of cold climate must be looked for and provided for, if apple-growing ever became general in this region.

I have therefore been led to an examination of the geological bearings of this subject, which I will briefly present.

In common with nearly all the large internal rivers of our state, the Fox in its main tributary, the Wolf, finds its fountain head at the "backbone of the state," in the Azoic or Lacustral region—among the granite rocks—some 900 feet above lake Superior, and 1,400 feet above sea level, in latitude 44–50. It flows about 100 miles in a southerly direction through this formation, which we will call district No. 1, or the granite district. It then passes into the lower sandstone formation, over another 100 miles, where it unites with the southern branch, which has flowed its 100 miles, draining the waters of Green Lake, Marquette and Waushara counties, and parts of Columbia and Adams. This we will call district No. 2. These then united waters break through the Lower or Magnesian and Trenton limestone formations, which we will call district No. 3, into the basin of Lake Winnebago and Lower Fox, or the 4th district.

District No. 1 embraces over 54 townships, or nearly 2,000 square

miles of area. Its geology indicates that it will be in the years to come as fruitful of wheat, rye, potatoes and apples as it has been of lumber. Its specialty, however, will doubtless be its nutritious grasses and first-class dairy products, which will give it money to buy what they cannot grow.

District No. 2 embraces about 80 townships, equal to 2,880 square miles, of the Potsdam sandstone region, or Jack Oak region, which, *as such*, can never be a first-class fruit-growing region without the frequent application of mineral and mechanical elements to the soil. But fortunately this large area is frequently broken up by overtopping ridges and bluffs of the upper strata of the Lower Limestone, which is found in the white oak lands and in the Calcareous drift, which grows large burr oak, poplar and hazel. These exceptional soils should be sought out as the oases of the desert, and used for fruit growing in all this district. Where so used, they are a success, from the southern limits in Columbia county to the northern limits in Waupaca county.

District No. 3 embraces the Magnesian and Galena limestone formations, which lie parallel, from ten to twenty miles wide, from east of Portage City on the south to the Menomonee river on the north, a belt ten to twenty miles wide embracing about 700 square miles within the drainage of Fox river and the bay.

The high lands of this district are naturally well drained, with a calcareous soil, rich in mineral elements, and these in good proportions for fruit trees. Furthermore, they lay alongside of the great internal natural thoroughfare of the state, whose varied industries are but in their infancy, which means an increasing home market for good fresh fruit to an almost unlimited extent. This district is full of fine locations for extensive orcharding, where a judicious selection of varieties will, with ordinarily intelligent care, be sure of success.

The fourth district is that of the immediate basin of Lake Winnebago and the Lower Fox, but mostly on the west of these waters down to the Menomonee, embracing about the same area as the last named district. This belongs, geologically, to the Trenton and Galena limestone formations, but whose soil is almost universally a marly clay. Our state geologist says of it:

"It is finely comminuted, compact, adhesive and almost impervious. It however is never so tenacious when wet, or so hard when



dry, as true aluminous clay. It contains fragments of limestone and other rocks that modify it. Chemically not a true clay; contains a notable portion of Silica, Lime and Magnesia. The large ingredient of the two last is very fortunate, as they add much to its value. The presence of iron, in the form of hematite, gives it its reddish color. It is an exceeding strong and fertile soil; its strength lying in its mineral constitution, and not in a superficial layer of vegetable mold soon to be exhausted."

That cultivation will improve this soil I need not say to those who have farms located on it. It is one of inexhaustable resources, but which nature is holding back for future generations, that will freely give labor for gain in its culture. This soil and subsoil has all the elements of tree growth in great profusion; but it is so retentive of water, that trees start slow in spring, and from the same cause prolong their growth too late in the fall, leaving the tree utterly unfit for the extremes of winter that are certain to follow. Hence the reason why varieties that are almost sure to fail here are successful on the limestone soils of the high country on both sides of this basin, where there is a good natural drainage, even as far north as Green Bay.

DRAINAGE is then the key which will unlock the door of success in all this district in the practice of fruit growing. If Pres. Stilson finds his miles of under-drain to be a paying investment in the increase and perfection of ordinary farm crops in this vicinity, so will he find it pay a hundred fold more to thoroughly under-drain his orchard ground. If Pres. Smith, of our State Horticultural Society, finds it pays a hundred per cent. to under-drain a "sand bank" to secure early maturity of garden products, why not take the hint from his renowned success in that direction, and as thoroughly under-drain the orchard and vineyard, strawberry and raspberry plantations, in this cool climate and retentive soil? I believe it is a positive necessity of this climate and soil.

If on level land or nearly so, I would lay out the orchard ground so that the rows of trees will be thirty feet one way and fifteen feet the other, and ridge the thirty feet spaces as much as can be done by successive back furrowing, until the ridge is twelve or eighteen inches higher than the center or dead furrow, where the under-drain is ultimately to be. This work may be greatly facilitated by the use of a heavy roller after each plowing. The trees then may

be planted on the crown of this ridge, not deep but near the surface, and well banked up to hold them firm until they become established. We recommend the same place for the grape and other small fruit, narrowing the spaces to suit the needs of the plant. The under-drain should be from two to four feet deep, and may be put in the orchard or vineyard in one or two years subsequent if first prepared in this way, but the ridge form should always be preserved, and we would prefer the ridge to run north and south, and of necessity only one way. But on hill sides that are liable to wash, we would always row parallel with the hill, never plowing up and down the hill if avoidable. By this treatment, three very desirable ends will be secured:

1st. Early and continuous wood growth as well as early and perfect maturity of the wood, which implies vigor, health, fruitfulness and long life.

2d. Extending the list of varieties that may be safely planted, from the universal crab to the general or special list of our best apples.

3d. The home production of fruit.

The 3d district, embracing the lower Magnesian and part of the Trenton and Galena limestone, also the St. Peters sandstone formations as before described, needs no special directions for their guidance, but to persevere in well doing.

The 2d district — the sandstone region — as such, is one of difficulties in the way of permanent success, from a lack of needed elements in the soil. When the native timber is removed, and the surface deposit of vegetable mold is exhausted, plant food will have to be supplied from abroad at an unusual expense to the farmer. But even here the occasional beds of marly clay, the more frequent beds of peat, and the scattering elevations of lime rock soil, or the outcropping of granite, will all be made available for the pressing needs of fruit culture, if faithfully utilized.

In these very sandy locations I would recommend the use of clay, to be incorporated in the soil, close around the tree at the time of planting, and every three years after a circle of clay to be worked in the soil at about the distance of the outside tops from the trunk. If this be a marly clay, an annual top dressing of good ashes with stable manure for mulch, if the land be impoverished by cropping, will supply the poorest sand with tree food. If the clay be of the

alumina or blue clay order, it will need the addition of lime with the ashes, but both these can be of service only in small quantities and applied annually. Good peat from the swamps is rich in all the elements of tree growth, and may be used freely as a top dressing. The use of clay as mentioned above will improve the mechanical condition of sand, making it more retentive of water and of all the enriching materials which may be applied.

Most of the clays of this state are largely impregnated with lime and magnesia, and act both as mechanical and enriching agents to these very sandy soils.

*General Propositions*, 1st. The chief difficulties in the way of fruit growing in "Fox River valley" are not climatic.

Fond du Lac has the same winter temperature as Mazomanie and Platteville. Oshkosh corresponds with Ripon, Portage City and Lone Rock. Neenah and Menasha with Baraboo, and even Menominee with New London, New Lisbon and Viroqua in its mean winter temperature.

This statement is based on Lapham's map of isotherms for January, which shows that the average temperature of that month at Milton was about 22°, Oshkosh 20° and Menominee 18°, while Green Bay has a mean summer temperature in July of 68°, Ripon 70°, Milton and Baraboo 72°, with the same line running north-west and leaving the state a little below Hudson.

These observations show that this region is more favorably situated as to equality of temperature than any of those points southwest of it, where fruit growing is successful to a marked degree, and it has less extremes of heat and cold than some of the most successful fruit locations of the state.

2d. The hardiness or endurance of a tree is as much determined by its manner of growth as by its variety, and the most hardy varieties may be made tender, in a given soil and climate, by manner of growth, or the conditions of soil and moisture, while in different locations in the same climate they may be abundantly hardy. You may by careful selection of varieties make apple growing a success in favorable locations in all this region of country, but to make it universal, you must control and direct the growth of your trees from early spring to the closing up of the season's growth.

In order to do this it will be necessary to feed the soils that may be wanting in natural tree food, and limit the feed in soils which are exceedingly rich.

I have given directions for the first, or feeding lean soils. To restrain the over-rich soils from producing too much growth, trees should be set on natural or artificial ridges, thoroughly drained in soil and subsoil. Then give moderate or no culture after June of each year, and in strong clays, trees may better be kept in grass after once established. The richer the soil and the more retentive of water it is by nature, the more care is needed in this matter of restraining growth, and maturing the wood perfectly before winter.

Sandy soils may require a good winter mulch to save the roots from winter and spring killing.

I would especially commend the use of the highest bluffs, and the coolest situations on them for orchard sites. I can refer you to very successful orchards of our ordinary hardy list of apples and pears, situated on these places, and in the midst of the very districts which are pronounced unsafe for fruit trees. Such are to be found on the bluffs east of Green Bay, also in Waupaca county, where we find among the granite bowlders, and on the cool side of the clay hills, orchards which should encourage the people there in their efforts in fruit growing. We have found even the Ben Davis apple thriving and bearing finely there, and a fine row of Sweet Chestnut which have been fruiting for years.

We could give names and localities in abundant proof of these things, but we commend every observing person to look around him and learn the lesson from his own observation.

On the subject of *varieties* I will say, that the ordinary or extra hardy list, recommended by our state and local horticultural societies, may be depended upon in these best locations and with good treatment.

For very lean soils only the most vigorous and strong feeders should be planted, such as Duchess, Haas, Plumb's Cider, Hooper or May Seeknofurther, Maryland Redstreak, Walbridge. These also will do well as extra hardy for strong clay soils.

But in very uncertain locations the improved Siberians can be used with a certainty of success, and will give both quality and season for all domestic uses. In these we have the hope of the most northern portions of this state.

Do not depend on seedling apples; no promiscuous lot of seedlings are in any way reliable, either for quality or hardihood. Yet we have some new varieties of seedling apples which promise to be



very useful in extending the list. These should be fully tested in the most trying conditions and varied soils, and their merits fully proved before they come into general use.

In conclusion, I would advise the planting of home grown trees, from nurseries which are making a specialty of varieties and culture to meet the demands of your climate and soil. Encourage the formation of clubs and societies for mutual instruction and protection, as well as co-operation in the purchase of fruit trees from reliable sources, and you have good reason to suppose will be *true to name*.

Patronize and foster your state and local societies, which are doing so much for the advancement of your interests as producers. Read carefully their publications, for they contain the best thoughts and opinions of the most careful observers of your time and calling, and by all means persevere in your efforts to grow fruit for home use.

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## FARMERS' BOYS AND GIRLS.

BY MRS. D. HUNTLEY, APPLETON.

There is nothing in which the farmer should take a greater interest than he does in his boys and girls, and this interest should include all that pertains to their physical, intellectual and moral development, and should be continued and constant during all the years from infancy to maturity. It is not enough that food, clothing and shelter are provided for the little ones; they also need a loving sympathy with their wants, a kind attention to their forming tastes, and the stern hand of justice to lead the growing mind up to a useful manhood. But too many parents, when they have provided all things for the physical wants, turn to the arduous labors of the field and the farm house, thinking the children will be all right; they are too small to be sent to school, too small to be of any use on the farm, but when they are a little older they will come along into the work and be some help; thus the years slip away, and the boys and girls have formed tastes and habits which neither precept nor example will be likely to change. "The twig is bent,



the tree is inclined," and the parents find, when too late, that their children are not what they wish them to be.

It was said of one farmer, that as soon as his little babe could run about the fields, his father, in a playful way, would ask his advice about the farm work; in spring he would say: "Well, Neddie, what do you think about sowing wheat to-morrow? Shall we plant the garden next week, and then get in the corn?" And later in the season he would ask Neddie if it was not about time to commence haying, and so on all through the year. In this way the boy became interested, he soon wished not only to talk about the work, but to help do it, and now that boy, at sixteen, can neither be coaxed nor driven from the farm, and it has been observed that he accomplishes more work than many farmers in middle life. Another very successful farmer, so far as his crops were concerned, but thinking more of the hard work than of its benefits, was often heard to say: "I do not wish my boys to become farmers, they must have some easier way to get a living;" and acting accordingly, his boys were early sent to the town, and to-day one is a banker in an eastern city, the other a merchant.

Whatever truth there may be in the oft repeated assertion, that our young men are deserting the farm, that the girls hate farming, is due mainly to some mistake in their early education; not that all the children of farmers can be drilled like so many soldiers, to fall into the ranks, and make farming their business; this is in no way desirable; the point to be gained with these children of the farm is, so to conduct their home life that they will not become disgusted with the labors, the responsibilities, the isolation from society, or any of the various conditions to which farmers are subjected; not only this, it should be so conducted that the boys, and the girls as well, may lose none of the benefits arising from country life. It may be a difficult matter to do this, but the parents who have these two objects constantly in view, with whom the fixed and determined purpose is new every morning and fresh every evening, that their children shall be respectful, obedient, industrious and useful, will rarely find those children speaking contemptuously of their home life. If there is discontent in the home, we need not go very far to find the cause, and with vigilance enough, we need not go but little farther to find the remedy. There are two reasons why there is so much dissatisfaction among the farmers' children. The

boys will tell you they cannot make money fast enough, while the girls will tell you they cannot have the money they have earned to purchase books, music, fine apparel, or to make their rooms attractive and pleasant as those of their city friends; if they could do these things, they would be delighted with their rural home. This is the class of boys and girls who see in farming more advantages than in any other calling, and who should not be discouraged with the never ceasing cry of hard times, poor crops, low prices and hard work. It would be well for those boys and girls now in the outset of life, to remember that it requires neither forethought nor labor, nor energy, to make hard times anywhere; simply sit down at your ease, or go listlessly about, waiting for some new opening, and you will have hard times without further effort; you can make drudgery out of any employment, and then you will have hard work and no time in which to perform it.

Whatever industry of the farm you may select for your special work, you will find use for all your faculties, both natural and acquired. If you turn your attention to wheat growing, stock raising, fruit, or the wool interest, mixed husbandry, or last, though not least, the dairy, you will need eternal vigilance to bring you success. It is your privilege to select that branch of farming which will pay the best, with the least capital, and which will turn your labor into money in the shortest time. There is nothing which small farmers can engage in that will do this so well and so surely as the dairy. If only a few cows can be kept, these will pay until more will grow up to add to your income. In this way the farmers of the old Green Mountain State have brought their wealth from the rocky hillsides and sunny intervalles of their farms.

There, twenty-five years ago, those eastern farmers sold their cheese for four, six, and eight cents a pound, seldom at the last named price; if their butter brought them thirteen or fourteen cents a pound, they were quite satisfied, and if by special contract with some hotel in a distant city, they could get sixteen cents — no families thought of paying that — they would furnish butter the year round at that price. These same farmers bought their calico at sixteen, eighteen and twenty-five cents a yard, and their cotton cloth at a shilling, yet they grew rich; farm was added to farm; sons went to college, daughters were clothed in the finest fabrics the merchants could offer, and to-day these farmers have money at interest for fu-

ture use. Profiting by their experience, we of the west may do the same. Here in Wisconsin in our own Outagamie county, we have all the conditions of soil, grasses and water, above the average for dairying. In every sunny opening in the partially cleared fields the white clover, the sweetest food for the dairy cow, comes in unsought, and the fresh green grass comes, "Creeping, creeping everywhere," in all the gardens and cultivated fields. You who have attempted to grow a small strawberry bed understand this perfectly.

Why not utilize this almost spontaneous growth, and turn it into a remedy for the hard times and privations of which we complain. Here in our own city, we get more than double the price for butter that those eastern farmers did and we buy our calico at five, eight and ten cents a yard. One farmer in this county has not sold a pound of butter for some years past for less than twenty-eight cents; from that to thirty-five, and it has sometimes been sold for over forty cents. In the iron regions of Lake Superior, butter has been sold for seventy-five cents a pound. If we wish for better prices than we can get at home, doubtless a market could be created; with all the different lines of railroad running to the mining regions, the pineries, and the cities and towns, something could be done in shipping butter to other places.

A first class article, of firm grain, fine flavor, and rich color, will bring the highest price in any market. This kind can be made here as well as elsewhere.

We speak especially of butter, because that is the beginning of dairying. It comes within the reach of the smallest farmers. If it pay but little at a time, it comes steadily from week to week with the coming wants, and enables the family of limited means to do that very desirable thing, pay for what they buy and run up no bills. As the capacity of the dairy increases, three or four farmers may unite the milk, and make very good domestic cheese. This alone, in rotation, would relieve each family from the constant care of the dairy, and give the wife and daughters two or three weeks at a time of comparative leisure. This method of manufacturing milk in company would soon originate a cheese factory, which removes nearly all the work of the dairy from the farm house, and is found very remunerative wherever skillfully conducted. Just here the question arises, What is the matter that western farmers are not on the high road to wealth? There is but one answer to this question.

We go too fast; we should put on the brakes, go slower, keep down our wants, and live within the income. If this is too hard, make the income larger.

Nor is this all. There is no industry of the farm so well adapted to the farmer with growing children as the dairy. The work is not inappropriate for either boys or girls. It is work that must be done thoroughly, neatly and promptly, and the knowledge acquired in doing any work in this manner is applicable in all business relations in after years. But would you have girls do the milking? We would have the girls know how to do all the work of the farm which they can do, as well as their brothers; then if sickness or absence, or any circumstances make it necessary, there is no confusion, no standing still of business, because there are only girls at home; the work moves on; girls become efficient, useful and beloved—not one bit the worse, but better—for the good they have done. When circumstances do not require it, they may turn to more delightful employment; the music of the piano is just as sweet, whether they set down the milk pail or lay aside the most elaborate embroidery. It is this mysterious thing called circumstance that decides what is properly woman's work; and the kind attentions of thoughtful husbands and fathers, and brothers, will control the circumstances. The more pleasant work of the dairy may be made a very lucrative business for women; high wages are paid for this kind of work; the prizes offered compare favorably with some that are given for literary labor; besides, it is no small accomplishment to know how to make excellent butter. Mr. Carpenter, of New York, will tell you it requires more skill to make first class butter than to make a watch. If you would excel in this art, you may learn to put up the sweetest tub of butter, that will keep the whole year, or you can make the most artistic print butter, put up in dainty rolls, stamped with a rose bud or sheaf of wheat, or marked with your own initials and made in tiny balls, ready for the daintiest silver dishes, and wrapped in whitest muslin, packed in ice and sent to the city market. You and your butter may acquire a national reputation. If this work is done with promptness and efficiency, and you go about it clad in neat calico, with single skirt and ample apron, and waste no time in ornamenting the garments of labor with ruffles and puffs, or in washing and ironing these useless trimmings, you will find some time each day for reading, study or



recreation. If you are the faithful, dutiful assistant of your mother in all the complicated labors of the farm house, you are fitting yourself to adorn some beautiful home in city or country that is waiting for you, where you will become the true help meet which God designed you to be. You may seek for some position which you think higher than this, or which you think will make you more beautiful or better beloved, and you may waste the best years of your life searching for it, but you will never find it.

"Beautiful hands are those that do  
Work that is earnest, and brave, and true,  
Moment by moment the long day through.

"Beautiful feet are those that go  
On kindly ministries, to and fro,  
Down lowliest ways, if God wills it so."

There is another class of farmers' boys who never will, nor never ought to remain upon the farm; they have not the qualifications requisite for successful farmers; all their tastes lead them to some other pursuit; they will be needed elsewhere; they will do honor to the professions. To these, especially, something must be said. You find yourself to-day on a farm, removed from the delights and pleasures of city life; you wish to see and know of the things of which you have read; you hear of literary societies and lectures, of college classes and college honors, you love books and study, and would like to be in school the whole year, instead of a few months in fall and winter; and perhaps some boy of your acquaintance, not as old as you, has been sent to a distant university to complete his education, while you think you are left upon the farm with no chance to learn anything or do anything but hard work; you say "It is nothing but hurry from spring time till harvest, and then the night and morning chores are more than all the rest, and it is no use to try to be anybody and live on a farm." This is a dreary outlook for an aspiring boy; but the half has not been told, and, fortunately, the other half is the sunny side. These difficulties which seem to you now a barrier to all improvement, if you do but overcome them, will be the very stepping-stones to your greatness.

These are the very things which will make you patient, strong and self-reliant, and this lesson of self-reliance you must learn, sooner or later; if you learn it in youth, you may begin life a man,



in mind as well as stature; if you learn it later, it is at a fearful cost; if not at all, you will go ashore a wreck.

The things you so much wish for may not be the best for you. It is pleasant to be shielded from care, to be furnished with money to be watched by friends; but this is as though in your small garden, you should plant the seeds in spring time and water and care for them, and then shade the young plants from the sunshine and protect them from the winds, and keep them in luxuriant growth till the long days of summer, then remove the protection and withhold your care, and then expect to find blossoms and fruit for your reward in the autumn.

You feel that you have no time for improvement in your studies, but you have the same twenty-four hours in each day that is given to every mortal; no one has more than that; if time is used rightly, and the work of one hour or day is not put over till another, there will be a portion of time for reading, study and recreation, even in your farm life. You have the broadest opportunity for physical culture; good health is the very foundation of a useful life; many a young student has found an early grave from exclusive study, and the want of this same manual labor which you now deplore. You may not make as rapid progress in your studies as you wish, but you must remember that the practical knowledge of the labors of life is what you must first learn; that which you find in books is excellent, and a portion of it must go along with the practical till this is attained; then go, if you wish, and drink long and deep from the fountains of knowledge.

The circumstances of your parents will have much control over the time you can devote to study. If they can send you to college at sixteen or eighteen years of age, it may be well, but see to it that you do not suffer loss by your early departure from the parental roof.

If you must remain in your home and aid in the daily labors of the farm, do not complain; this, for you, is the path of duty, and this difficult and narrow way leads only in one direction and that is always to success. While treading this path, you are building better than you know, even in your young years; you are of some use in the world; you are acquiring the kind of riches that never will take wings. Do not deplore the poverty which keeps you at home; it is the children of the poor, oftener than the children of the mil-

lionaire, that become eminent and useful. The road to fame and to honor does not lead through college halls; many a young man has been compelled to give up his studies, his hopes of graduating honors, and turned to manual labor, and in this, which is mistakenly called the "humbler walks of life," has found distinction and wealth.

The scholars and the statesmen that have lived and passed away, during our hundred years, have not been the most useful or the best beloved.

We think, with admiration, of our Jefferson, of John Quincy Adams, of Edward Everett and Charles Sumner, but these and their eloquence will be forgotten, while the good deeds and comprehensive words of our "Martyred President" will live forever in the hearts of his grateful countrymen. If you would be loved and remembered, after you have passed away, it must be by what you have done, not by what others have done for you.

To-day, there sleeps in "Greenwood," with the monument of enduring bronze above his head, one whose boyhood and early manhood were one continual struggle with poverty, privation and rugged labor; in later years, when successful in business, he was the same untiring worker for the good of his fellow men, and now, though "dead on the field of honor," Horace Greeley still lives, and his name will be loved and remembered as long as the sunbeams shall play over his grave.

You cannot hope for better things than this, you cannot have a rougher road than that over which the benefactor of his race has passed, and if your parents, like his, shall decide that just what they can do for their children without the aid of others is all that is best their children should have done for them, you, like Mr. Greeley, may live to thank your parents for their nice decision. But do not be discouraged; work steadily on; keep ever in view your cherished purpose; when you have passed from boyhood to manhood, begin your lifework; there is time enough then for all the study needed in the professions. If you would be a physician, the labors of the farm have given you that knowledge of hardships, of exposure to heat and cold, sunshine and storm, which will fit you well for that responsible profession. If you would take up the author's pen, you will have the broadest sympathy with the wants and wishes of mankind, you may touch the heart of the humblest

worker, for you know whereof you speak. If you would do good to all men, teach the right, and point out to erring mortals "the best path to heaven," nothing will so acquaint you with God's work as your early association with the mysteries of nature; there you have learned the patient waiting for seed time and harvest, which you will need as you sow the seeds of truth in the highways and byways life. Wherever you may go, whatever calling you may choose, if you pursue it with industry and integrity, and struggle bravely "to convert obstacle into opportunity," the highest places will be at your command, the best gifts of the people will be bestowed upon you; and may the record of your good deeds become an enduring monument to your memory.

Mr. Hoard: After hearing that paper, it brings back my boyhood days again, and I have never heard a better elucidation of the subject than the paper just read by Mrs. Huntley. I have often thought of what old "John Brown" said, that every one should do the best he could, and the dearest and best boy he ever knew was our *old boy*.

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## NOTES ON THE GEOLOGY OF NORTHERN WISCONSIN.

BY K. M. HUTCHINSON, OF OSHKOSH.

In order to arrive at a clear conception of the geology of any section of country, its geography or physical features should be first understood, since the surface has been determined generally by the underlying rocks, which through various agencies have been dissolved, and have given character to the soil resting upon them.

The inorganic portions of all soil are derived from the decomposition of rocks. If the surface soil is strongly impregnated with lime, we find it resting upon a stratum of limestone, as we know the case to be in the eastern and southern portion of the state. If the soil is sandy we find the substratum to be sand rock, as in the case of Waushara, Waupaca, and Portage counties. The geography of the northern portions of our state presents no very remarkable or prominent feature for description. The scenery, on a whole, may be somewhat diversified and beautiful, but not grand.

It has no mountains that have been thrust up by mighty agencies from beneath, lifting their broad shoulders above the plains, giving grandeur to the picture, but in their place are wide spreading plains, immense forests of timber, wide flowing rivers which have cut, during long ages, deep and wide channels through the solid rock, leaving bold escarpments, often picturesque, and affording charming variety to the landscape. Its innumerable lakes, with their surroundings, possess an unequalled sylvan beauty.

#### CLIMATE.

We have not the perpetual spring of the tropics, but better than this, we have a climate diversified and conspicuous for its purity, and best adapted for physical and intellectual development, nor have we the brilliant vegetation of the tropics, yet we have a vegetable growth better adapted to the wants and comforts of the human race. On the east and north lie two great inland seas, their ceaseless roar uttering prophecies of future power and commercial wealth, and bearing upon their broad bosom the floating citadels of commerce, laden with the productions of our soil. On the west the grand old Father of Waters, with its many tributaries, rolls its flood through fertile valleys to the sea, freighted with such annual stores of abundance as would enrich a realm. We may not have much of classic interest to boast of, no Roman Coliseum to mock humanity with records of cruelty, no sculptured monuments, whose hieroglyphics puzzle the learned to translate; yet we have our mounds more ancient than these, upon the ruins of which giant oaks, those chronicles of centuries, have grown old and decayed, and have left no record of their origin or date. A mystery hangs over them which no human ken can penetrate. They are the works of the Mound Builders, and that is all.

The state of Wisconsin is as well watered as any in the Union. Its lakes, except Winnebago, are not large, but numerous. The streams, generally, are not sluggish, and the water very pure. The soil, on a limestone base, is unequalled for grains and grasses. It abounds in minerals, and its immense forests of pine and hard wood timber, seemingly inexhaustible, are a great source of wealth to the state.

The geological history of Wisconsin is one easy to read and understand. The student need not go farther than through the first

two chapters (the Azoic and Silurian) in the great history of the globe, when he will have learned all that the rocks in Wisconsin can teach him, because the Devonian or age of fishes, the Carboniferous or the age when the coal beds were formed, the Reptilian or age of reptiles, the Mammalian or age of mammals, with all their subdivisions, are in this state wanting. The two formations, however, in the Azoic and Silurian, exist the world over the same as here; but they were not built upon in Wisconsin by these subsequent formations, because they were above or very near the surface, while in other sections, when these later formations are imposed, they lay many fathoms under water. It is in place here to state briefly, in order that what is to follow may be clearly understood, the generally accepted theory of the condition of our globe at this period, or "in the beginning." In "the beginning the earth was without form and void," or, in other words, was in a molten embryo state, or in a condition of "igneous fluidity." That such was its condition is generally accepted as the most rational hypothesis. We must not, however, imagine the embryo globe to be like a smooth round ball set in motion diurnal on its own axis, or yearly round the sun. Geology tells us, in fact proves that vast irregularities in its surface existed, trifling, perhaps, compared with the bulk of the globe, still vast in comparison with any which now exist upon it. Whatever the causes, whether from internal heat or not, yet then they were mighty gigantic mountains, vast caverns, huge craters, boiling and seething seas of fire, "on all sides round, as one great furnace flamed." The earth at this period, existing as a mass of highly heated matter, must have held the waters of all the oceans, lakes and rivers, as they now appear upon the face of the globe as liquid, in a condition of vapor. The atmosphere about the incandescent planet was so hot that if condensation took place in the far off regions before they reached the surface the drops became again vaporized, and again and again returned, each time nearer and nearer the cooling planet.

In time the great drops reached the surface and were not converted into steam. The war of the elements then began. It was water against fire. Entirely new chemical combinations were formed. Elements seemingly dissimilar as sulphur and iron united and formed new bodies. The great laboratory of nature was in full force. Subtile chemical elements fought against the obdurate gran-



ite, eating out and dissolving its substance, and thus wearing away the roughly uneven surface, and sweeping the debris into the valleys below. When we behold these granite rocks, as they exist elsewhere in mountainous forms, we bow before their eternal stubbornness of strength, and are liable to consider them as adamantine in structure; as if formed to defy the elements of decay. Yet the same law of dissolution that exists now, existed then, and all the rocks of the globe then, as now, as soon as they became exposed to water or the atmosphere, were liable to change. They began to wear down. These Azoic rocks, strong, and hard, and tough, as we always find them, possessing elements of permanence and apparent indestructibility, shiver before the subtle wedge of the frost; melt under the soft lambency of the streamlet, and wither in untraceable decay in their own substance. The disintegration consequent upon such a condition of things must have been enormous.\* Lofty summits melt away and the worn off fragments, carried by the currents downward, were deposited in the valley at their feet. Thus the high peaks were lowered and the valleys raised until the two met, forming the wide plains that cover the northern portion of our state. The Azoic rocks, therefore, are not the rocks formed by the cooling of the original surface, but are the same rocks attained over by the combined action of water and heat, and are, therefore, called metamorphic. The rocks of the Azoic age are the foundation upon which all other and subsequent foundations were erected in after times. They covered the whole globe and preceded animal and vegetable life. But we cannot yet learn these primary rocks, for it is from them that the materials for the first series of rocks deposited by the agency of water alone, viz., the first sandstones (the Potsdam), were derived. In this structure we find them destitute of any apparent stratification, and unlike sand or lime rock, wherein each particle is the same as any other, and held together by the introduction of some cementing material; we find their three constituent minerals, quartz, feldspar and mica, sometimes so closely and proportionately blended as to make a very good building stone, but more often they are widely separated, each forming separate beds or veins. They became thus separated, it may be, by chemical affinity, or more likely by the greater specific gravity of some over other fragments, as they were dissolved and washed out of the original rock by the action of water. That this may be a fair solution of the reason why we often find

the materials of granite in these later rocks, separated, that is, the mica by itself and the quartz and feldspar by themselves, will be clear to us by simply throwing a handful of gravel or earth into a swift running stream. We see at once that the water divides the material, the heaviest particles soonest sink, while the lighter are carried still farther on, and the very lightest carried by the current fall only when they reach shallow places where there is no current, when they finally settle, forming beds of mud on the bottom. Of the three minerals, quartz is the hardest and most abundant. It cannot be scratched by a file; it has no cleavage structure, for when struck a sharp blow it breaks as easily in one direction as another; it will not melt by heat except when combined with an alkali, and it enters largely into the composition of all rocks. Compact sandstone and ordinary loose sea shore sand is almost wholly quartz. It is owing, therefore, to its great hardness that it has survived the attrition with the other minerals, and its great abundance is shown in the immense beds of sand-rock and loose sand resting directly upon the present rock left there by the receding sea. Thus is explained the origin of the sandstone that underlies all the other stratified formations, and which are at the surface in the form of loose sand as seen in many counties of the state. When free from organic matter this sand soil is worthless for agriculture, which has caused it to be spoken of with more emphasis than elegance, as the *Potsdam* sandstone.

Next after quartz comes feldspar. It is not as hard as quartz, and unlike it also it has a cleavage structure. Soda and lime enter more or less into its composition. From the decomposition of this mineral come the various shales and clays of which pottery and common bricks for building purposes are obtained. When in contact with quartz, the latter being the hardest, ground it into an impalpable powder. By the action of water it was then carried to quiet and shallow estuaries where it was deposited, forming beds of clay as we now find them. Mica, being a silicate of alumina, shared the fate of the feldspar. The first of the series of stratified rock, the sandstone, having been deposited, a new element in rock making appeared upon the scene. This was lime.

The origin of lime is claimed by some writers to have been a chemical deposit; others maintain that it is solely organic, in other words, that all limestones are composed wholly of the ground up

fragments of seashells, corals, etc. That it was deposited in the sea, is fully proved by the fossils it contains. It is true that over vast areas of this rock not a trace of a fossil can be found; but the same power that ground up and pulverized pebble and sand would very easily reduce the less solid sea shells to fine power, thus entirely obliterating them. But in other sections are often found whole strata composed entirely of fossil. An illustration of this may be seen on a cutting through limestone on the Airline Railroad, a few miles from Fond du Lac. There can be seen a stratum composed almost entirely of the pentamerous, an abundant fossil of the Niagara period, while in the stratum above and below it no trace of a fossil remains. The thickness of the limestone formation in Central Wisconsin is insignificant in comparison with the same rock in other states. North of a line running westerly there is a narrow strip of limestone lying on the north side of Green Bay, irregularly of course; from Green Bay, if found at all, it is in very thin and detached masses. It thickens as we go south, but diminishes northward and finally disappears.

But the land was not yet fitted for cultivation. The receding sea has left it a rocky, barren waste. Except in detached and limited areas there was no soil.

The elements that constitute the inorganic portion of soil was not wanting, but these materials must be brought together. The clay, the sand and lime, the important elements in plant life, must be commingled and ground up, the result being a homogeneous mass, fitted up for the growth of that variety of vegetable products necessary for the support and happiness of man. That agency in time appeared and is called the Glacial epoch.

The mind is appalled when it contemplates the magnitude of this mighty agency, and the work it performed. The northern half of the continent gradually became first bound in the manacles of ice. The babbling brook and the wide and deeply flowing river were checked in their journey to the sea. The sighing sound of quiet pools, wooed by summer winds, and ceaseless roar of mighty inland lakes, lashed to fury by the hurricane, were alike hushed to stillness by polar frost.

The accumulating ice and firm land became indissolubly bound together and Arctic dissolution reigned supreme over the northern half of the continent.

A movement of this vast body of ice and snow, the result of expansion, was next inaugurated. Slowly, but with a mighty and irresistible power, it began its journey. The work it accomplished was commensurate with the agency employed; it tore up and diminished, in some sections, whole formations, ground them to powder, and spread the debris over vast areas. It scooped out deep and wide basins where now repose our quiet inland lakes. It filled up and obliterated former river beds, and compelled them to cut new channels for themselves. It planed down the high places, and leveled up the valley, establishing the present geographical outlines of the continent, and finally it assorted, abraded and mixed the various mineral elements that compose our soil.

There we see that the great fundamental law of life, growth and development which was established "in the beginning," and which is clearly discernible on the law which govern the vegetable and animal kingdom, also governs, controls and modifies the physical world, has brought it from chaos to an organized condition, has harmonized its discordant elements and produced that state of complete harmony in all its parts as a condition best fitted for the occupancy of man.

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## SHORT-HORN CATTLE.

BY ELI STILSON.

This breed of cattle show the wonderful effect of the long continued line of breeding, that has so powerfully stamped its well bred animals with such prepotency, or power to transmit their desirable qualities in so remarkable a degree. On the cathedral in the county of Durham, England, built about the year 1093, is engraved the likeness of a good short-horn cow, showing that nearly 800 years ago the type of excellence in the short-horn cattle was well fixed. In the county of Durham, they have always been celebrated for their great milking qualities as well as excellent beef.

From there they have spread throughout England — they have even become great favorites in the highlands of Scotland, trenching in on the homes of the Ayrshires and Galloways, until the



breeders of short-horn cattle in Scotland compete successfully with those of England and America. The first importations to America were about the year 1800, but only about sixty years have elapsed since they began to be imported in considerable number. But late years America has been exporting short-horns to England in large numbers, and at good prices. They have been imported into Australia from England, and have been exported from the United States to Japan, where they are proving a success. In fact they are doing what Alexander tried to do, but failed — conquering the world, or the civilized portion of it. In fact in whatever country man eats beef and dairy products, there the short-horn is bound to go, if that country has good grazing lands. As to the price of good short-horns, they will vary like the price of other like products. There is no more danger of overstocking the short-horn market than there is of beef and dairy products. The extreme prices of certain favorite families cannot probably be maintained, but well bred short-horns of unquestionable pedigree will always find a market.

The great mission of the short-horn cattle is to grade up the common or native cattle of the country. The grade short-horn is preëminently the common farmers' cattle. The cows are good milkers, giving a good quantity of rich milk, and when they have fulfilled their mission in the dairy are easily fattened, making a large beef, and commanding extra good prices. And right here permit me to say, do not keep cows to extreme age in the dairy, as the milk becomes poorer, and the value of the cow is nearly lost for fattening.

My own experience taught me, while in the milk business, to go out and buy good sized cows with some short horn blood in them, and push the feed on them, keeping up the flow of milk in paying quantities as long as I could, and then dry them off and fatten them rapidly in a short time, and then sell them for nearly enough to buy two more good new milch cows. The great milk dairies of London are high grade short horns. In fact, the common farmer must utilize both the beef and the milk, if he would succeed.

The short horn and their grades have taken most of the prizes of state agricultural societies, where the amount of butter made in a given period has been the test. Next to them in point of awards, on the same test, have been the Jerseys.



## GRADE SHORT HORN STEERS.

While distancing all other breeds for the use of the average farmer, as a cow, the grade short horn stands without a rival for breeding steers for beef. The high price of the thoroughbred cow puts her beyond the reach of the average farmer for the production of steers for beef. And while experience has demonstrated that grade bulls cannot be depended on for uniformity in breeding stock, yet high grade short horn cows, with thoroughbred short horns as sires, can be relied upon for the production of steers rivaling the thoroughbred, and at a trifle of the cost. In fact, experience has shown that the high grade has those powers for taking on flesh equal to the full blood or nearly so. The three-fourths, seven-eighths, or fifteen-sixteenths possess a much higher feeding quality than the per cent. of short horn blood represents, owing to that law of nature, the prepotency of the thoroughbred. Mr. John D. Gilbert, the well known Logan county (Illinois) breeder and feeder, recently sold one hundred and twenty-eight high grade short horn steers, averaging 2,100 pounds, at seven cents per pound gross, bringing the nice sum of \$147 per head, and amounting to \$18,816, and the same number of extra choice native steers, and with the same feed, would have scarcely averaged 1,400 pounds gross, and are quoted at \$5 per hundred, which would make them \$70 per head, and amount to \$8,960, or a slight difference of \$9,856 in favor of the one hundred and twenty-eight high grade short horns. And the fraction of that difference, namely, \$856, invested judiciously in short horn bulls at \$150 each, would easily have produced those results in a few years, leaving a net difference or profit of \$9,000 over a like number of choice native steers. It takes as much feed to grow a native steer to 1,400 pounds as it does a high grade to 2,100 pounds. Native steers cannot be produced in Wisconsin, owing to the long winters and high price of land, with any profit whatever, while high grades will yield good profit. This is my experience and that of hundreds of others who have carefully tested it.

And as this is the case with the natives, which may, at four years old, be forced to 1,400 pounds, what must it be with those breeds where the cows only average 700 to 800 pounds and the steers 1,000 pounds for extra ones, and owing to their want of adaptation to take

on flesh, they are not even the equals of the natives. As a large breeder of one of those breeds remarked to me, that he attempted to fat a few steers of that breed, but that they could not fool him again in that way, as the experiment was a bad failure.

The profits of farming are too small for the farmer to lose on any considerable portion of his working capital to reproduce itself. Or, in other words, from the calf to the cow or steer, and from thence to the butcher's stall, there must be no time that the animal will not pay the cost of feed, or the farmer will find his profits are wasted, and, like some merchants, with too many shelf keepers on his hands.

Mr. E. A. Bissel, of Richmond, Mich., sold recently at Detroit, five three year old grade short horn steers, averaging 2,300 pounds each. The best stock feeders of Illinois will buy only grade short horns for feeding, but the supply is so short that many are compelled to buy natives and Texas cattle, and raise with small profits and feed with less. Let a person visit the stock yards in Chicago a few years ago, and compare the scrub stock of Wisconsin, as the cattle dealers called them, with the Illinois grade steers, and he would see why the Illinois feeders were getting rich, while Wisconsin farmers were raising inferior stock at a positive loss. But I am glad to say that the reputation of Wisconsin beef cattle is improving.

William Lysaght, my rival and compeer in agriculture and stock, in the southwest part of this state, has been coining money for years from feeding grade short horns on a large scale. The farmers are beginning to learn the value of grade short horns, and localities where best known and longest bred are the localities where we can best sell thorough bred short horns.

About 30,000 thorough bred bulls have been recorded in the American Herd Book, and not over 12,000 are now in use in the United States, while we have 35,000,000 cattle. Though they are owned in every state of the Union, their mission is hardly begun. They have gone to the plains, and up the North and South Platte and Yellow Stone rivers, and over the mountains to California and Oregon, and up the Columbia river to Washington territory; they have gone to the parks of the Rocky Mountains, and to the valleys and foot hills of coast range and Sierra mountains. They have invaded Texas and forced their way under greater difficulties than in

any other state, until they have reached the Rio Grande. The long horned Texan is slowly but surely going to disappear before his formidable rival, the short horn, or be improved by him. And shall the Wisconsin farmer, who is noted the world over for his thrift and intelligence, fail to add to his wealth by improving his stock? Most assuredly not. There is a marked improvement year by year of the stock in this state.

#### EARLY MATURITY OF HIGH GRADES.

This is a very important factor of the problem of the farmer's profits. It takes a large proportion of the food consumed to support nature, keep up the animal heat, and restore the waste of the body, leaving but a part for the growth and production of flesh and fat. Even more food is consumed by the thin, lean, bony natives to just support nature, than by the larger and well bred grade. Hence, the grade short horn which will mature at three years, as well as the native at four years, makes a clean saving of one year's keep to support nature, besides their better adaptation to take on flesh and fat, which will still farther augment their profitable returns for the food consumed. And again, there is a quicker return for the capital invested by this early maturity. Good handlers, as the stockmen express it, are good feeders. Any observing farmer can soon learn to tell that essential to a good animal, "quality." A careful examination of stock will soon teach the breeder to tell quality by the touch of the fingers.

#### THE FUTURE CATTLE MARKET.

The first look, when looking at this rapid improvement of stock, may suggest an overstocked cattle market; but the result so far shows that the demand for choice grades will increase faster than the supply does. Refrigerator steam ships freighted with the quarters of dressed beef of extra quality, are now running successfully from America to England, and others are soon to start for France and other ports of the European continent. The quarters are hung up so as to allow the passage of air blown through an ice chamber, and thence through the cargo, so as to render the transportation of beef a success, and it arrives in excellent order.

Here again the grade short horn are the only cattle that we have that will furnish the beef that will thus pay trans-Atlantic ship-

ment. The shipment of choice grades alive was tried, but as the live cattle and their feed required about ten times the space of the dressed beef on ship, the profits were consumed in transportation. While it touches the national pride of the proud Briton to eat of the beef produced by his western cousins, the fact that it was yearly growing scarcer and dearer, until it costs as much money to buy the rich man's roast beef for one dinner as it cost his ancestors five centuries ago to buy an ox; and the poor laborer there can only afford the cheapest quality, and that not often. Hence, to them this new source of supply is a boon of great value.

Where is the American in whose bosom glows the love of country and his country's success, whose eyes have not been blinded by political party prejudices or British gold, that has watched for the last fifteen years the triumphs of American industries and products, not only to England's dependencies, but also to England proper?

The following letters will be read with interest:

"THE SITUATION AS IT APPEARS TO A SCOTCHMAN.

"13 KIRKGATE, PERTH, SCOTLAND, December 18, 1876.

"Farmers here are crying out more and more every year; and no wonder; everything that they have to sell, getting cheaper, and labor and everything else they may have to buy getting dearer, together with high rent and late seasons they are to be pitied. Stock farmers have been doing best, for the past few years, but I am afraid even their good time is at an end; when I tell you that Glasgow is the center of the cattle trade in Scotland, for live and dead meat; and that 1,000 to 1,500 head are considered an average supply per week; and when I tell you further, that, on Thursday last we had in Glasgow about 500 to 600 carcasses of American beef, from 500 to 600 live sheep, and a large quantity of fresh pork, besides live turkeys, etc., from the same source—you will not be surprised at stock farmers beginning to cry out also. I am confident that we are to get our future supply of meat, both fresh and cured, from America. I use it daily, and can say it is as good as anything I ever saw. It is sold here at about 6d. or 7d. per pound, or about 14 to 15 cents. If only once it is fully introduced it will get better liked, and consequently higher in price. This is a subject Short-horn breeders on your side should not lose sight of, that there is sure to be in the near future a growing demand for good graded



stock for export to this country, and in consequence, a large demand for Short-horn bulls. — *J. S., in Western Stock Journal and Farmer.*"

"AMERICAN BEEF IN ENGLAND.

"'The roast beef of Old England' has been a national boast for many years, but it has become so costly that a large proportion of the people know but little of its flavor. Recently enterprising Americans have arranged to send large quantities of beef by steamers from New York. The cooling process is so perfect on board the vessel that there is an arrival every two or three days, of an immense quantity of this beef in fine condition. At first the dealers attempted to decry it as unfit for use, and, by combining, only bid 7 cents per pound for it when offered at auction. A host of private parties rushed in and bought it at 10 and 12 cents. Temporary sheds and booths were hastily erected, and the meat is offered at retail at from 12 to 18 cents. It is amusing to see the crowds which gather in hundreds, after a fresh arrival, and struggle for an opportunity to carry off a supply. One of these places will dispose of 100 to 200 quarters in a single day, and the people stand and look anxiously at the shop after it is all gone. The price of similar beef has long been from 20 to 25 cents per pound, and the new supply is a great boon to the working classes. American flags are flying, and the letters U. S. A. blaze in gas-light over the doors, and the people bless the Yankee ox for his savory addition to the English table. Good judges pronounce this beef of most excellent quality, and, I am glad to say, it surpasses anything in that line which I have eaten in seven years. The voyage of ten or twelve days renders it tender and juicy, and if the supply does not fail, there will be no limit to the consumption. — *London Letter to the Boston Herald.*"

I have thus explained to you that it is through grading up of the common cattle of the country, that the great value of the Short-horn reaches the great mass of the farmers. He who will double the productive power of a blade of grass is as much a public benefactor as he who causes two blades of grass to grow where but one grew, provided both give the facts of their experiments to the world. We find some men so narrow minded and jealous, that they will do nothing to build up agriculture for fear some men more en-



terprising than themselves will reap the rewards of their labor, though it be a public benefit, and as one expressed it, the fairs ought to put a stop to paying premiums to fine cattle, as it made them so ashamed of their poor kinds of cattle at home. While I own a fine herd of thoroughbred Short-horns that will add much to the agricultural wealth of the state, my greatest net profits so far have been in grades; two thoroughbred sires used in breeding grades for a series of years, gave me a net return of \$1,000 each, though costing only about \$150 each.

Those master breeders that have moulded and fashioned and bred our domestic animals until they are objects of beauty, symmetry, and profit, have raised to themselves monuments more lasting than the Egyptian pyramids, and so long as civilization shall last, the names of Collings, Bates, and Booth, of England, shall be remembered, while those of Alexander, Warfield, Renick, and the Bedfords, of Kentucky, and Murray and Brockaway, of Wisconsin, will long be remembered as successful breeders of this noble race of cattle; yea, long after the names of back salary grabbers, Credit Mobiliers, political ring masters and dishonest office holders shall have passed into oblivion, or be remembered only in dishonor.

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## SOME FAMILIES OF INSECTS.

BY W. A. KEL'ERMAN.

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The object of this paper is to describe, in a popular way, a few groups of insects which for reason of benefit or injury to crops and vegetation are, or should be, of interest to the agriculturist. The farmer or farmer's sons seek in books for an account of the swarms of insects with which they come in contact, but usually are unsuccessful, mainly because they do not understand the rudiments of the science of entomology; the terminology is incomprehensible, and of course the descriptions are useless.

The account of any insect, of the nature of its ravages, of the methods to be employed for its destruction, will evidently be of no avail whatever, unless the insect is known to the person. You can't

separate the tares from the wheat unless you know which the tares are. Now no farmer can be expected to learn all the species of insects. The entomologist who lives with them his life time don't know them. But the farmer can learn a few families of them, which have especially to do with the production or nonproduction of his crops. And when we reflect what millions of dollars every entomologist, by his investigations and suggestions, saves the country annually, it ought to be a great stimulus for philanthropic farmer boys to follow in his footsteps, and losing no time, set themselves at once about acquiring a practical knowledge of our insect friends and foes. The balance between animals and plants has been greatly disturbed by our clearing of forests, and destructive war on weeds that afford food for insects, compelling the latter to resort, with great reluctance often, to the crops man designs for his use alone. Their enemies are friends; and the birds in the past have been hunted for sport and killed for pastime, thereby allowing fuller sway to the ravages of insects, and the more fruitful exercise of their enormous reproductive powers.

Surely entomological knowledge is compulsory in the farmer's curriculum. That the families described below may the better be understood, I must say that for conveniences of description and study, insects have been grouped in seven suborders. These are readily recognized by a few points in their external anatomy. Thus, hymenoptera, such as bees, wasp and ants, have membranous wings the hind pair smaller; the lepidoptera, or butterflies and moths, are covered with microscopic scales, the powdery substance easily rubbed off; the diptera, or flies, have but one pair of wings; the coleoptera, or beetles, have hard wing covers (elytra), meeting in a straight line on the back; the hemiptera, bugs and plant lice have usually the bases of the upper wings hard, or when of uniform thickness, slope at the sides like a roof; the orthoptera, grasshoppers and crickets, have the lower wings plaited like a fan; and the neuroptera, or dragon flies, have large netted wings, the hinder part usually a little smaller. Of the families described, the first three belong to the suborder hymenoptera, the next two to lepidoptera, the next two to diptera, the next four to coleoptera, the next one to hemiptera, the next one to orthoptera, and the last one neuroptera. No originality is claimed in the descriptions, and no special knowledge of the insects.

ICHNEUMON FLIES (*Ichneumonidæ*). This family receives its name from the habits of the insects, which somewhat resembles the ichneumon, a carnivorous animal, said to be very destructive to the eggs of the crocodile. They lay their eggs usually in the larvæ of other insects, or in the pupæ, adults or eggs. From these hatch larvæ, which are soft, fleshy, footless grubs, with a rather small head. They devour the fatty portions of the larvæ, of course killing the latter, and in this manner doing immense benefit to the agriculturist. The larvæ spin cocoons when about to enter the pupæ state. In the the larger species, this consists of an inner dense case, and a looser outer covering.

The fly, when transformed, escapes through the skin of the caterpillar, or whatever object it has infested. It is easily recognized, by the usually long and slender body, the long ovipositer which protrudes from the body and cannot be withdrawn. They use this in some cases as a weapon of defense, but of course it frightens more than it hurts, as it has no sting and nothing poisonous. It is too weak even to be inserted through the skin. The ovipositer is protected by firm stilets of the same length; head rather square, antennæ long, file form, many jointed, but not elbowed. The species are numerous, two thousand having been described in Europe.

There are as many more in America. Gerstæcker estimates that there are from four to five thousand species known. They do invaluable service to the farmer by their wholesale destruction of caterpillars. They also destroy spiders, cockroaches, hornets, solitary bees, American silk worm, boring insects, army worm, beetles (*Ptinidæ*), plant lice, moth of bumble bee cells, and suent moths. It is said that a certain species actually bores through solid wood to deposit its eggs in the larvæ of a horntail. The ichneumon flies sometimes give annoyance when rearing caterpillars to observe their changes, or secure the adults. These parasites are concealed, and gradually destroy the contents and life of their victim, the latter, however, appearing externally in perfect health. It may be emaciated, yet the growth of the destroyer within keeps pace with the loss of fat, and the proper distention continues. The larva may yet have strength enough to transform to the pupa, where it must succumb, and the transformed fly emerges from it.

SAW-FLIES (*Tenthredinidæ*). This family also includes four-

winged species, being of the sub-order Hymenoptera, and not two-winged, as the flies or dipterans insects are. The females possess a saw, as the name indicates. They use this for the purpose of sawing little slits in the twigs and leaves of plants, in which they insert their eggs. It is a curiously constructed instrument, and ingeniously used. It consists of two lamellæ, or saws, received in a chinck in the hinder part of the abdomen on the under side. Each has a back to steady and strengthen it, and teeth on the lower edge, also on one side, making a rasp of it. Of course they vary in different kinds of flies, but usually taper and curve upward. You can examine this apparatus quite satisfactorily under a strong magnifying lens. You will find the teeth different from an ordinary saw, being cones set in foot-stocks, deeply cut into eight or ten deep grooves, with a sharp edge between. This is not likely to be clogged with the green wood. The eggs are deposited by the instrument — such apparatus in all insects being called the *ovipositor*, or egg placer. You may find these slits with the eggs glued in on the small nerves of currant leaves, on the under side, placed there, evidently, for protection from rain, as well as because they are thicker there than above.

When the eggs hatch, larvæ are produced, which are usually cylindrical, and of a greenish color, lined and marked, being so much like caterpillars that they are called “false caterpillars.” They are easily distinguished from the true ones by the number of legs. Caterpillars have sixteen (or less) legs, while these have eighteen to twenty-two.

The prop legs are not provided with a hook as they are in the real caterpillar. They are mostly naked, or only with forked prickles on their back. Sometimes they have a white flaky covering, easily rubbed off; or are shiny, and then called “slug-worms.” Like the caterpillars, they cause great damage, often by their ravages on leaves. Some species cause galls or knobs where the larvæ live and feed. Sometimes they lay their eggs in fruit also.

Mr. Westwood found the young in apples that had fallen before they had grown to the size of walnuts. Many kinds are solitary; some live in swarms protected by a web which they spin for their shelter; some roll up leaves, and live in the abode thus formed; certain kinds live in the pith of plants, devouring and destroying.

When fully grown, they usually go into the ground, and live in



a silken cocoon of an oblong or oval shape, remaining usually through the winter. The adults mostly occur in the early summer, found on leaves of plants they infest, or feeding in flowers, especially of the umbelliferous species. They are sluggish, and do not make much effort to escape when about to be captured; they are rather short, and somewhat flattened; the head and thorax wide; the base of the abdomen is as broad as the thorax, and closely joined to it; the antennæ or feelers varying much, are generally short, simple and clavate; the wings overlap and cover the back horizontally. The chief characteristic has already been described, namely, their saws. The larvæ of the largest species may be found on the leaves of the elm, birch, basswood and willow trees; of another, on the Tartarean honeysuckle; of another, on the cranberry in the east; of another, on the current and gooseberry; of another, on the vine; of another, on the raspberry; of another, on the cherry and pear; of another, on the rose, on the fir and pitch pine; and of another on the white pine.

**HORN-TAILS (*Uroceudæ*).** The males possess an abdominal horn, short and conical, or triangular; and the females have the same, modified into a boring apparatus, which gives the common name to the family.

By means of it they bore in solid wood with remarkable ease, for the purpose of depositing their eggs. This borer is hinged to the middle of the belly, and received in a furrow, and consists of five pieces. The two outer form a scabbard to receive the two needles. Above the latter is a back to them, notched on each side. The needles are as large as a hair, very strong and elastic. Examine them with a microscope, low power, and you will find a most interesting structure.

It is straight and stiff, ending in a sharp head, the outlines being broken into a series of notches. Now look at it with a higher power, and find that it is armed with long sharp teeth, which curve inward. The shaft has on each side a series of sharp edged ridges, running diagonally across it; by this it can make a clear cut hole, which it does usually in fir trees, for the deposition of the eggs. The young which are hatched from these are cylindrical and fleshy grubs, whitish, with a small, rounded, horny head, and a pointed, horny tail. Their jaws are powerful, and are used in boring in the



wood, upon which they feed. They transform in these holes in their cocoons. The chrysalid is similar to that of other hymenoptera, that is, somewhat like the winged insects in form, yellowish-white in color, wings and legs folded under the breast. When this skin is cast off, the adult creeps to the mouth of its burrow, gnaws through the coverings of bark, and comes into the open air. The horn-tails are of large size, long, cylindrical body, large, hard, square next the thorax, but much rounded in front.

The antennæ are long and file form. The habits of one species are thus described by Dr. Harris: "The female, when about to lay her eggs, draws her borer out of the sheath until it stands perpendicularly under the middle of her body, when she plunges it, by repeated wriggling motions, through the bark into the wood, when the hole is made deep enough. She then drops an egg therein, conducting it to the place by means of the two furrowed pieces of the sheath. The borer often pierces the bark and wood to the depth of half an inch or more, and is sometimes driven so tightly that the insect cannot draw it out again, but remains fastened to the tree till she dies. The eggs are oblong, or oval, pointed at each end, and rather less than one-twentieth of an inch in length." It would seem that the farmer has comparatively little to fear from this insect, although they are destructive to pines and firs. One species infests the elm, pear and buttonwood.

**BUTTER-FLIES (*Papilionidæ*).**—This first family of the lepidoptera, which I will characterize, has, like the others, for its larvæ, *caterpillars*; working incalculable harm to the agriculturist. The whole suborder, including more than twenty-four thousand species, may at once be set down as common enemies, living, as they almost entirely do, on vegetation, eating leaves, buds, fruit, seeds, bark, pith, stems and roots of plants. Others devour cloth, wool, furs, feathers, wax, lard and flour.

The family papilionidæ comprises about five thousand species, though most of them inhabit the tropics. About a thousand are found in North America. The larvæ vary in shape and style of ornamentation, but they invariably have five pairs of abdominal legs. The pupæ generally have golden spots, and hence are called chrysalids. They are angulated on the sides of the thorax and upper side of the abdomen. The adults have knobbed antennæ, though

sometimes nearly fly-form. Body small, the three groups better proportioned than in the moths. Ocelli usually wanting; the spiral tongue or maxillæ greatly developed; wings carried erect in repose, not held together by a bristle and socket in flight, as in moths. These insects have great powers of reproduction. Harris estimates that each female lays from two hundred to five hundred eggs, and one thousand different kinds of butterflies will produce on an average three hundred thousand caterpillars; if one-half this number, when arrived at maturity, are females, they will give forty-five millions of caterpillars in the second, and six thousand seven hundred and fifty millions in the third generation. These data, he says, suffice to show that the actual number of these insects existing at any one time must be far beyond the limits of calculation.

The greater part of caterpillars subsist on vegetable food, and especially on the leaves of plants; hence their injuries to vegetation are immense, and are too often forced on our notice. Some caterpillars herd together, sometimes uniting their labors to construct tents, serving for habitation or shelter; others make holes in the pith of plants, or in the pulpy substance of the leaves, and still others conceal themselves in the ground, emerging only for food. They change their skin three or four times before commencing transformation.

The process of spinning cocoons and transforming have doubtless been watched with interest by nearly every one. It is so easy to rear most species by capturing and feeding the larvæ, that I will assume that every one has done it, and learned the methods from nature, and not second handed or from books.

They attack all the common plants, as carrots, parsley, apple-thorn, sassafras, lilac, spicebush, cabbage, turnips, milkweed, silkweed, violets, plantain, willow, poplar, balm of Gilead, nettles, elm, basswood, hop, hollyhock, scrub oak, grasses, kelenia, rhodora, les-pedeza, pine, locust, etc.

*ZINEIDS (Lineidæ).* The insects belonging to this family are tiny, but not for this reason called Zineids. The name is an old one, signifying simply a clothes-moth. Because of their minuteness they are sometimes called microlepidoptera. They are very numerous, new ones being discovered all the time, and probably more than are known remain to be discovered. The larvæ are

called moth-worms. The word *moth* signifies to gnaw or to eat, and was formerly more restricted in its use than now. These moth-worms usually gnaw holes in and through the material of clothing fabrics and of leaves, doing their work of destruction unobserved. This furnishes them food and material for nests or coverings for their body. Usually they are cylindrical, and of a dirty-white color, brownish head, and a brown spot on the first wing; they are naked, or at most, have only a few scattered hairs. They have fourteen to sixteen feet, and usually spin a cocoon when about to transform. Packard says: In seeking for the larvæ, we must remember that most of them are leaf-miners, and their burrows are detected by the waved form of the withered lines on the surface of the leaves, and their fras or excrement, thrown out at one end. Some are found between united leaves, of which the upper is crumpled. Others contract portable cases, which they draw about the trunks of trees, fences, etc. Others burrow in the stems of grasses or in toadstools and in the pith of currant or raspberry bushes; most are solitary, a few gregarious.

A bush stripped of its leaves and covered with webs, if not done by the tent caterpillar, will witness the work of a zineid.

Buds of unfolded herbs suffer from their attacks, such as the heads of composite flowers, which are drawn together and consumed by the larvæ." The chrysalids are brown, and rather more slender than of moths generally.

The adults are easily recognized by their small size, slender body, and the very long fringed wings.

The latter lie on top of, or are rolled around the body when at rest. Among the pests included in this family, I might mention the common clothes-moths, a small insect of a light buff color, with a silky iridescence. The wings are long and narrow-pointed, with most beautiful and delicate long silken fringe. It flies about in May, and later, laying eggs in woolens and sometimes in cotton.

All house-keepers know that woolens and furs should be carefully shaken and examined early in June. Harris says that "powdered black pepper, strewed under the edge of carpets, is said to repel moths. Sheets of paper sprinkled with spirits of turpentine, camphor in coarse powder, leaves of tobacco, or shavings of Russian leather, should be placed among the clothes when they are laid aside for summer; and furs and other small articles can be kept by

being sewed in bags, with phials of camphor-wood, red cedar, and of Spanish cedar; while the cloth-lining of carriages can be secured forever from the attacks of the moths by being washed or sponged on both sides with a solution of corrosive sublimate of mercury in alcohol, made just strong enough not to leave a white stain on a black feather." But I cannot speak here of individuals or tell remedies. Suffice it to remark that, besides injury to cloth, species attack wheat, grains, leaves and buds of wild plants, locust rose, leaves of apples, pear, etc.

**GALL FLIES** (*Cecidomyidæ*.) The females lay their eggs in the stock of cereals, and the stems and buds of various plants producing unnatural growths or excrescences called *galls*. The eggs hatch usually in a few days and then appear little colorless (becoming yellow with age), footless larvæ, pointed at both ends, with mouth parts very rudimentary. They suck the moisture and sap from the plants they inhabit, or absorb it through the skin. They undergo transformation in the ground, affording some peculiarities which I cannot here detail. The flies issuing from the pupæ are minute, delicate, slender bodied, clothed with long hairs. The wings are folded over the back and have generally three or four longitudinal veins.

The best known example of this family is the Hessian fly, so named because it was supposed, probably erroneously, to have been brought in some straw by the Hessian troops in the time of the Revolution. It was observed first in 1776, in the vicinity of Sir William Howe's debarkation on Staten Island, and at Flat Bush on the west end of Long Island. From thence it spread inland at the rate of about fifteen or twenty miles or more a year. Wheat, rye, barley, and sometimes timothy, were attacked by them, doing immense damage, causing in some places the abandonment of the cultivation of some of the crops. Harris gives this description of the insect. "The head, antennæ, and thorax of this fly are black. The hind body is tawny, more or less widely marked with black on each wing, and clothed with fine grayish hairs. The egg-tube of the female is rose colored, the wings are blackish except at the base, where they are tawny and very narrow; they are fringed with short hairs and are rounded at the tips. The body measures about one-tenth of an inch in length, and the wings expand one quarter of an inch or more.



After death the livid body contracts and becomes almost entirely black." The fly lays twenty or thirty eggs in a crease in the leaf of the young plant of wheat, which hatch in a few days. They at once proceed downwards till they reach a joint where they remain, increase in size and become impressed into the stem, which withers and dies in a few days. Thus, although belonging to the family of gall flies, this and a few others do not produce galls.

Another example also doing great damage is the wheat midge which attacks the wheat in the ear. The females lay their eggs in the blossom from which issue in eight or ten days the transparent maggots. They crowd around the forming grain which of course cannot develop.

Another species of the same genus causes galls at the ends of willow twigs; another attacks the gooseberry; another the wild grape. Many willows suffer from the attacks of these insects. Of these Walsh has described more than fourteen species.

HORSE FLIES, ETC. (*Muscidæ*).— This family is of great extent, one, Wood says, which may rank with the ichneumon flies, the noctuæ and tineæ moths and the beetles as tests of entomologists' temper and patience. It is hardly possible to imagine anything more trying to the entomologist than to have half a dozen large boxes of muscidæ placed before him, with instructions to find out their names, and to marshal them in their right places. The task really seems to be a hopeless one, and life to be too short for accomplishing it, more especially as there are sure to be some hitherto undescribed species, and they are equally sure to come first to hand, as if for the express purpose of making the unfortunate entomologist hunt for their description in vain. At least a thousand species of muscidæ are known to inhabit England, and it is probable that twice that number may yet be discovered and named. The insects are small, the common horse fly having about the average dimensions. The family is variously subdivided by entomologists, but easily circumscribed as a whole; you have only to find that membranous proboscis, terminated by two large fleshy lobes, to know that you have an example of muscidæ. The larvæ are footless, more or less cylindrical and conical, narrowing in front with a head variable in firm and hook-like maxillæ. The pupa is enclosed in the puparium, cylindrical or the shape of the larvæ. The bite of the



saw flies is painful. By this means the pest fly kills cattle. Some species are parasitic on caterpillars, others are found in the nest of bees. One preys on the army worm, one on the larvæ of the Colorado potato beetles, and other beetles suffer from the attacks of certain species. It is said the flesh fly is viviparous, and that the large ovaries sometimes contain twenty thousand eggs. The blue bottle fly and meat fly deposit their eggs on decaying animal substances, and notwithstanding their great agility are often very troublesome.

The horse fly is common enough in summer and in winter. For wonderful adaptability, study carefully the proboscis of this insect. The eggs are laid in the dung of barnyards, and there the transformations take place. The larvæ of other flies live in decaying vegetable substances. The radish fly abounds in the roots of the radish. When the leaves of the onion turn yellow and die, it is because the onion fly larvæ are at its roots.

The seed corn maggot in the east destroys the kernels of sprouted corn before it comes up. The cabbage maggot is injurious to the cabbage. Others live in rotten turnips, some live on leaves and pulpy fruit of the cherry, olive and orange, some in the oak. The cheese maggot is the larvæ of a fly of this family, so also is the wine fly, a species that attacks apples. In England, they infest wheat and barley. Linnæus estimates the loss of the latter at half a million dollars. Finally many are leaf miners, much resembling the micro-lepidoptera in the larvæ state.

GROUND BEETLES (*Carabidæ*).—This is a family of very beautiful beetles, of very great extent, difficult to limit, the species varying much. The characters of the mouth parts in the main determine their place in classification, points not to be named in a popular treatise like this. The legs are slender, long, fitted for running. The anterior and middle cexæ are globular, the posterior one dilated internally. The tarsi are five-pointed, nearly all the species are predaceous, run in the grass, lurk under stairs, debris, sticks, bark; from chance they go out at night to hunt, ridding many an injurious insect for the agriculturist. They are dull metallic or black. The larvæ, usually black in color with a single fleshy leg beneath, are elegated rather broad, the terminal ring of the body being armed with two horny hooks. The beautiful Cal-

osoma may be taken as the example of the family. It lies in holes in the sod of fields for its prey. Another interesting example is the Bombardier beetle, and having glands from which it discharges with an explosion a pungent fluid, probably to protect it from its enemies. A species of *harpalus* eats cut-worms and other injurious larvæ; another feeds on *curculio* larvæ. Sufficient is said to give an idea of the great service this family does to the farmer, and the right it has to preservation and multiplication.

**WEEVILS (*Curculiariidæ*).** There is no person who does not know the *curculiariidæ*, or weevils, and I need not say they have long probosces, near the middle of which are situated the long elbowed antennæ. These timid and death-feigning beetles have hard, usually round bodies, and sometimes are exceedingly minute. The larvæ are fleshy, footless grubs, having fleshy tubercles in place of legs, and thick curved jaws. They feed on seeds, nuts, pith, bark and roots of plants, flowers and leaves. The species are very numerous, eight or ten thousand already known. I will mention a few examples to slightly illustrate their ravages. A species of *brenthus* punctures the bark of the white oak and the grub bores into the solid wood. Many species are said to roll up the edges of leaves, thereby forming little nests of the shape and size of thimbles, to contain their eggs and to shelter their young, which afterwards devour the leaves. Another species injures the cultivated and wild roses; another the pod of the wild indigo; one is formed on hazel bushes; the pine, especially the pitch pine, is destroyed by the pine weevil; the white pine weevil is another to be recorded. The plum gougier makes a round puncture in the plum; instead of living in the pulp, it devours the kernel, and is said to transform inside the stone of the fruit. Walch reports it common as the plum *curculiæ* in Illinois. Some appear to be parasitic on a certain gall fly and plant lice. One punctures the apple. Then there is the cranberry weevil, the plum weevil, the grain weevil, the black weevil, the grape *curculiæ*, potato-stalk weevil, grape-cane weevil, species that attack the seeds of the radish and similar plants, and many others too numerous to mention.

**LEAF BEETLES (*Chrysomelidæ*).** This family of eight or ten thousand species feeds on leaves, as the common name indicates. They are oval or oblong, often very thick and convex above, with

short antennæ. They have round, prominent eyes, a narrow, cylindrical thorax, and the hinder thighs often much thickened in the middle. The gaily colored larvæ, beset with thick, flattened tubercles, or branching spines are short, rounded, cylindrical or flattened. These, as well as the adults, feed on leaves, some of them being the most destructive known. One species is injurious to the grape in the western states, it is said, cutting straight, elongated holes of about an eighth of an inch in diameter in the leaves, and when numerous, so riddling the leaves as to reduce them to mere shreds. An introduced species is doing much injury to the asparagus in the east. One mines in the leaves of the apple, another in the leaves of the locust; one attacks the morning glory, another the silk weed. The well known striped squash beetle belongs to this family. The grape-leaf flea beetle eats the buds and leaves of the grape; the striped turnip flea beetle eats the turnip beneath the ground. This family would have distinction, however, if the Colorado potato beetle alone belonged to it, an insect known for its deeds as universally as the grasshopper.

LADY BIRDS (*Coccinellidæ*). This family of beautiful beetles is pronounced the "greatest of benefactors to civilized man." The larvæ feed on plant lice, devouring countless multitudes of them, and saving many crops. The lady bird, then, ought not to be ordered "to fly away home," but to receive treatment of the most encouraging kind. The only disgust that can arise is from the unpleasant odor emitted. This is caused by a yellowish liquid issuing from the joints of the limbs. They may become so numerous that it will be exceedingly disagreeable, or even unbearable. Every body knows these insects at sight — hemispherical, generally red or yellow, with round or lunate spots. The long oval eggs are often laid in a group of plant lice, which in due time are devoured. The larvæ are long, pointed behind, often gaily colored and beset with tubercles or spines. When about to transform, the larvæ attaches itself to a twig or leaf by the end of its tail, with its head downward. The skin splits down the back, remaining, however, and protecting the larvæ till it changes into its perfect form. The adults are sometimes very changeable in color, the same species red spotted with black, black spotted or blotched with red, black, spotted with yellow, yellow spotted and barred or blotched with black,

and so on endlessly. There are said to be upwards of a thousand kinds or species. In some seasons, says Wood, the swarms of lady birds almost exceed belief. I have seen the street absolutely red with them, and the houses covered with their multitudes, while within doors a thick band of them ran along the angle of the walls and ceiling like a red cable, large bundles hanging in each corner. Those belonging to the genus *Scymus* are very small, of a blackish color, sparingly clothed with short hairs. The young are clothed with short tufts of most delicate white down, and are ferocious as savage beasts, and well merit the name of *Scymus*, which means lion whelps. Harris says: "I have often seen one of these little tufted animals preying upon plant lice, catching and devouring with the greatest ease, lice nearly as large as its own body, one after another in rapid succession, without apparently satiating its hunger or diminishing its activity."

PLANT LICE (*Aphidæ*). These little green insects have long antennæ, from five to seven jointed, flask-shaped bodies, and slender legs. The early summer broods are wingless, the others winged. They are found on every part of the plant, and their ravages are well known to all. They are exceedingly prolific, for Reanmer has shown that one individual in five generations may become the progenitor of nearly six thousand millions of descendants. The development is interesting, as seen in the following, quoted from Dr. Burnett: In the early autumn, the colonies of plant lice are composed of both female and male individuals; these pair; the males then die, and the females begin to deposit their eggs, after which they die also. Early in the spring, as soon as the sap begins to flow, these eggs are hatched, and the young lice immediately begin to pump the sap from the tender leaves and shoots, increase rapidly in size, and in a short time come to maturity. In this state it is found that the whole brood, without a single exception, consists solely of females, or rather, and more properly, of individuals which are capable of reproducing their kind. This reproduction takes place by a viviparous generation, there being found in the individuals in question, young 'lice, which, when capable of entering upon individual life, escape their progenitors and form a new and greatly increased colony. This second generation pursues the same course as the first, the individuals of which it is composed being

like those of the first, or at least without any trace of the male sex throughout. The same conditions are then repeated, and so on almost indefinitely, experiments having shown that the power of reproduction under such circumstances may be exercised, according to Bonnet, at least through nine generations, while Duval obtained thus seven generations in seven months, his generations being curtailed at this stage, not by a failure of the reproductive powers, but by the approach of winter, which killed his specimens; and Kyber even observed that a colony which had been brought into a constantly heated room, continued to propagate for four years in this manner, without the intervention of males, and even in this instance it remains to be proved how much these phenomena might have been continued.

**COCKROACHES (*Blattariæ*).** These are flattened, ovate, head rounded and partially concealed; antennæ long, file form, and many jointed. They are nocturnal, hiding by day under stones, etc.; are found plentifully in heated rooms. Although considered troublesome, they do good deeds in the way of clearing houses, and strips of bed-bugs. As this family belongs to the Orthoptera, the larvæ resemble the dove, wanting wings.

**DRAGON FLIES (*Libellalidæ*).** These neuropters have a very large head and thorax, and a slender, long, cylindrical abdomen. The eyes are immense, often encircling the globular head. The antennæ are short and bristle-like, the large, veiny wings are densely reticulated, and the tarsi are three jointed. The eggs may be found in bunches on the stems of rushes and other aquatic plants. These hatch during the middle of the summer, and the long-legged larvæ issuing are destitute of the rudimentary wings, which appear in the more mature state, after one or two moultings. They are very active and voracious; can walk over the bottom of the stream or pool, or leap by means of a spring-like apparatus, through which it discharges a stream of water two or three inches backward, thus propelling the insect. The lavæ feed on aquatic insects, and the adults devour gnats and mosquitoes.



## THE DAIRY.

BY C. HAZEN.

It is with much hesitancy that I have attempted to prepare a paper to read before this convention on the topic assigned me, namely, "Dairy Stock." A subject that deeply interests a large portion of the average farmers of the state, and in which is invested, perhaps, as much capital and labor combined as in any agricultural pursuit in Wisconsin. The dairy interest is increasing rapidly here in the northwest. The surplus products are bringing in a large amount of capital annually, which is distributed among the husbandmen, laboring classes and business men of our state; which has contributed largely the past season towards lifting our people above the wants and privations that must necessarily have followed the financial difficulties that have been forced upon them for some time past.

The dairy cow is what I wish to call your attention to for a short time. The cow that will give the largest quantity and best quality of milk from a given, or equal amount of feed, is the one that yields the largest profit, and the one most desired by the dairyman. It is only the first-class cows that pay a fair profit when the prices of dairy products are as low as they have been the two or three past seasons. Hence, the all-important question with the dairyman is how to procure the very best dairy stock. And how are they to get such stock? In answer to this question I shall make some suggestions on how to breed and raise it, in connection with the influence our agricultural fairs and societies are having on the future excellence of some of the dairy breeds.

I can think of no subject that the dairyman and general farmer can be more interested in and benefited by than the improvement of the dairy cow. This can be done in two ways: First by selecting the very best cows to breed from; and the bull should be from the best milking families also. Strict compliance with the laws of breeding is absolutely necessary. That like begets like is the rule, and if we would succeed we must comply with this rule. Raise your best heifer calves, but care should be taken to raise them right. Second, I believe many excellent animals have been injured by in-

judicious feeding when young; some by over feeding, and some by starving them.

My observations and experience are, that calves that are fed too high, or fattened when young, and continued to be overfed and kept fat for the purpose of making show animals of them, or to see how large an animal can be made of them at one, two or three years old, are nine times out of ten injured for dairy purposes. The consequence is, a tendency is formed to put on fat, instead of converting the food into milk.

To raise calves for dairy cows, I have had the best success by feeding liberally; not enough to fatten, but just enough to develop the bone and muscle, and keep them growing until they are fully developed cows. I would feed so as to have my heifers come in when two years old; think they make better cows. If allowed to go until three years old before they give milk, they are liable to develop too much bone and muscle, and grow coarse; too much like steers, to make first-class milkers. It is not the largest cow of any breed, as a general rule, that is the best milker, but the medium sized.

Many of our dairymen are of the opinion that they can't afford to raise their calves; that they can buy cows for less money than they can raise them. This theory may be correct. I am of the opinion that cows can very often be bought for less money than it costs to raise them; but if this practice is to prevail; if the heifer calves from our best dairy cows are to be thus sacrificed, how long would it be before our dairy stock would begin to deteriorate in value. If there is any dependence to be put in natural laws, in regard to the breeding of stock, or if it proves anything (which every intelligent farmer, I believe, is willing to admit), it proves conclusively that Wisconsin farmers or dairymen cannot afford to slaughter their best stock. It has been stated by one of the best practical dairymen of Wisconsin, that he can raise ten or twenty calves or more from his best cows, and keep and milk them when they become cows, until they are ten years old, and get more milk from them and make more butter and cheese than he can from the same number of cows that he can buy in the same length of time, allowing the cows he buys two years more time to give milk than the cows or calves he raises from his own dairy. If this is true, the advantages attained by this practice are worth to the dairyman not

less than thirty dollars for every cow he raises on his farm. This is quite an important item for the farmers.

As the dairy interests of the state are increasing every year, both in quantity and quality, the dairyman that is subjected to labor 365 days in the year, feels more anxious to avail himself of all the advantages that can be secured by improvements, in every direction, and more especially in the improvement of his dairy stock. Whatever breed of stock the farmer has, always select the best to breed from. There are many fine dairies in this state that are mostly native cows, or in other words, made up of several breeds of which the characteristics of no one breed predominate, bred promiscuously for many generations. This class of stock is in just the right condition to improve upon by crossing with pure blooded stock.

In breeding pure blooded males on such stock, the offspring will, as a rule, inherit more of the sire's good qualities than the dam's. The reasons for this are that pure blooded stock have been bred for a particular object or purpose for many generations, until they have become a fixed type or breed, and when crossed with stock of no particular type, the blood of the thoroughbred animal being much the strongest will stamp itself more thoroughly on the offspring; much more distinctly than if two pure blooded animals of different breeds are bred together. For this reason every farmer that raises stock should make an effort to procure pure blooded males from the best milking families to breed from.

Here the question might be asked, What is the best breed of stock for the dairy? That depends on what use you intend to make of them. If for making cheese the most of the season, and butter in spring and fall as the most of our Wisconsin dairymen are doing, I would say that the Ayrshires and Ayrshire grades are well adapted to our northern climate; they endure our long cold winters as well as any breed of cattle on the continent that I am acquainted with; they are good feeders and good milkers, giving as a rule a large quantity of good rich milk, and continue to hold out their milk later in the season than our native cows, or short horn grades. I speak of the short horns because I have had more experience with that breed for dairy stock than any other except the Ayrshire. The Ayrshires are Scotch cattle, having been bred in that country as a distinct breed for the dairy, for more more than a century. This stock are said to have been proverbial milkers for many gen-

erations past, and have the best record for large milkers of any stock now in existence. There are records of single cows giving 65 and 75 pounds of milk per day, and the largest yield on record I believe was from the Ayrshire cow, "Old Creamer," owned by S. D. Hungerford, in Adams, Jefferson county, New York, which Mr. Hungerford claims to be the champion milch cow of the world. Winner of the first prize at the New York state fair in 1873, having yielded in 3 days 302 pounds of good milk as follows: June 11th 100½ pounds, 12th 100 pounds, 13th 101½ pounds. She gave 2,820½ pounds of milk in the month of June, an average of over 94 pounds per day; 2,483½ pounds in July, an average of over 80 pounds per day; and in the month of August, 75 pounds per day. "Old Creamer" was 9 years old, and weighed 1,080 pounds.

If a dairyman wishes to make butter exclusively, perhaps the Jersey cows would suit him full as well as the Ayrshires.

The Jersey dairies have the reputation of making the best quality of butter of any blooded stock in this country, but as a breed I believe make no pretensions toward making the greatest quantity. The Jersey stock are rather small, and rather tender for our cold climate; they require as a rule better feed and care than the native stock of this country, or the Ayrshires. We find many excellent milking cows among the Jersey grades.

The Jersey, Alderney, and Guernsey cattle were bred on the islands in the British channel, and have been bred pure for many centuries, and in this country they are all classed under the name of Jerseys, and registered accordingly.

If beef stock and dairy stock are desired in the same animals the largest breeds might be preferred by some farmers, among which are the short horns, Holsteins, Galloways, and the medium sized Devonshires, all of which possess many good qualities; and the Holsteins are said to be first class milkers. For beef the short horns stand at the head; for work oxen, the Devons take the lead; for cattle that never get their horns lopped or knocked off, you can bet on the Galloways every time.

All of the above named pure blooded stock are claimed to be pure and have regularly organized breeders, associations and herd book registers; and each breed or association I believe has a scale of points by which to compare animals of the same breed with their standard of a perfect animal.

But as the different breeds have been for so many generations and are now being bred for different purposes, of course a perfect animal of either breed must differ very much from that of any other. Hence the necessity of adopting some rule by which to judge the true merits of the different breeds by their own standard.

I wish to talk a little about the influence our agricultural fairs have on the breeding of dairy stock. And as the fairs (as far as my knowledge extends) in this state have been conducted, I must say that their influence has been in the wrong direction.

To explain myself, I will make a comparison between a short horn cow, and an Ayrshire. The short horn animal is the perfection of a square, straight, large, fat animal, fattened up and fitted for the occasion. A cow in one sense, but 9 times in 10, not giving a drop of milk at the time they are put on exhibition, and in a majority of cases, the show cows are not allowed to give milk for any length of time after calving, for the reason that if they do, it will take off some of the tallow that has accumulated in chunks on the different points, some of them nearly as large as a good sized wash bowl, which seems to be necessary in the eyes of judges on short horn stock to make a model short horn; this is the direction that short horn breeders are tending in order to get fancy prices for stock, say \$40,000 for a single animal, and that same \$40,000 heifer stuffed and crowded to that extent that she never produced a living calf, and she died before she was 3 years old; such stock breeding may be all right with a certain class of breeders, but what benefit are they to the average farmers of Wisconsin?

Let us look at a dairy cow giving milk (as Wisconsin dairymen can't afford to keep a dairy and let their cows go dry); if she is a first class milker and giving milk at the time of the fairs, she will be thin in flesh. This is the condition a milch cow should be in, in order to show the milking points of a first class cow to the best advantage. In making a scale of points for a perfect Ayrshire cow, the breeders' standard is 100 points or counts; the condition the cow is in can count but 5, and that is to be in fair dairy condition, neither fat nor lean.

Perhaps a scale of points for the consideration and convenience of judges of Ayrshire stock would be admissible in this paper, under the present circumstances.

I here give a scale of points that was recommended for the



judges, at the Centennial, of which the perfect animal has 100 counts, divided into 10 groups:

JUDGMENT POINTS OF AYRSHIRE COWS.		
<i>Group.</i>		<i>Counts.</i>
1. Udder .....		25
2. Body .....		10
3. Back .....		15
4. Skin .....		10
5. Head .....		10
6. Horns .....		5
7. Neck .....		5
8. Shoulders .....		5
9. Limbs .....		10
10. Condition .....		5
Total .....		<u>100</u>

Those groups are subdivided. Take the udder, for example, which includes five sub-groups of nearly equal value, as capacity, shape, and quality; teats, milk veins and ecutcheon marks. Such a scale of points, with full explanations, it seems to me, could hardly fail to give judges sufficient information in regard to the real merits of the animal to be judged as a distinct breed.

The same with the Jerseys, although their scale of points differs considerably from that of the Ayrshires.

I have copied the scale of points for the Jersey cows, as established by American Jersey Cattle Clubs, and by which the stock at the Centennial Exposition in Philadelphia, in 1876, were judged:

<i>Points.</i>	<i>Counts.</i>
1. Head small, lean, and rather long, face dished, broad between the eyes .....	2
2. And narrow between the horns .....	1
3. Muzzle dark, and encircled by a light color .....	1
4. Eyes full and placid .....	1
5. Horns small, crumpled and amber color ..	3
6. Ears small and thin .....	1
7. Neck, straight, thin, rather long, with clean throat, and not heavy at the shoulders .....	4
8. Shoulders, sloping and lean, withers thin, breast neither deficient nor beefy .....	3
9. Back, level to the setting on of the tail, and broad across the loin .....	4
10. Barrel, hooped, broad and deep at the flank .....	8
11. Hips wide apart, and fine in the bone; rump long and broad ..	4
12. Thighs long, thin and wide apart, with legs standing square, and not to cross in walking .....	4
13. Legs short, small below the knees, with small hoofs .....	3
14. Tail fine, reaching the hocks, with good switch .....	3
15. Hide thin and mellow, with soft hair .....	4
16. Color of hide, where the hair is white on udder and inside of ears, yellow .....	5

17. Fore udder full in form, and running well forward .....	8
18. Hind udder full in form, and well up behind.....	8
19. Udder free from long hair, and not fleshy.....	5
20. Teats rather long, wide apart, and squarely placed .....	6
21. Milk veins prominent .....	5
22. Escutcheon high and broad, and full on thighs.....	8
23. Disposition, quiet and good-natured .....	3
24. General appearance, rather lean or fleshy .....	6

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Perfection .....	100
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In judging heifers, omit 17, 18, 19, 20 and 21. The same scale of points shall be used in judging bulls, omitting 17, 18, 19 and 21, and making moderate allowance for masculinity.

In the Jersey scale of points, the udder and its dependencies, including Nos. 17, 18, 19, 20, 21 and 22, count 40 in the scale of 100, showing the value placed on the udder and its immediate dependencies by the standard breeders of dairy stock.

In order to make our agricultural fairs what they were intended for, to stimulate the agriculturists and breeders to improve the dairy stock in milking qualities, instead of running them to beef, some different course or standard for judging stock must be pursued from that practised in the past. When pure blooded stock of the different breeds are judged upon from any one standard, it must be apparent to all, that all the different breeds cannot have justice done them.

There are many difficulties in the way in trying to select competent judges in all the departments at our Fairs; but I believe there are none more so than the cattle department. We can usually find men of integrity and good sound judgment; but it is very difficult to find men that are well posted in the different breeds of stock. But if there was a fixed standard to judge by and necessary instructions given, I believe that plenty of good men can be found that will be willing to assume such responsibilities.

Unless some such course is pursued, there is nothing about our Fairs to stimulate or encourage breeders of dairy stock to exhibit their best stock. The facts are these, in the majority of cases, the best milking stock, or the best and most worthy animals do not win

Inasmuch as dairy husbandry is (or soon will be) the leading agricultural interest of the state. The breeding of dairy stock must necessarily be of more importance to the dairy farmer than all others combined.

In conclusion, I wish to state that at the Centennial Exposition at Philadelphia in 1876, Wisconsin dairy products took the lead, having received a larger number of awards in proportion to the amount exhibited than any other state, province, or territory on the continent. As compared with New York, Wisconsin exhibits some 270 cheeses, and received 20 awards. New York exhibited over 600 cheeses and received 21 awards; and butter in about the same proportion.

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## NOTES ON FAIRS.

BY K. M. HUTCHINSON, OF OSHKOSH.

It takes all things to make a fair. A fair must not be mistaken for a show. Shows are for specialties. There, we have horticultural, cattle, poultry, and baby shows; but all these and many more besides are necessary for a fair, not omitting the inevitable horse trot.

In England, fair day is another name for market day, it occurring once a week or month, and is instituted for the purpose of exchange or sale of such products as are brought in. This system in this country, though often tried, has, for some reason, failed of success. The machinery of a great fair is somewhat complicated. It requires very nice calculation, and much thought and study to plan the detail, and to so arrange conflicting interests as to avoid friction, and to make all its patrons equally satisfied. It is necessary that the rules established for its management be wise and judicious, the premiums offered just and equal; one class of exhibitors having no preference over another, and that all concerned work harmoniously for the general good, if the fair is to be a success. A fair is said to be a success financially if its executive officers are able to pay from the proceeds all its liabilities to the operatives and exhibitors, and leave a reasonable sum in the treasury for emergencies; and their ability to fulfill these obligations depends, of course, upon the patronage of the public. Our northern fair was not instituted upon any joint stock plan, the proceeds over premiums and current expenses to be divided among its members. It is purely mutual. If in any one year the receipts largely exceed the expenses, the fol-

lowing year the premiums are increased; if they fall short, they must be correspondingly reduced. Again, whether a fair is a success as an exhibition, depends upon the amount, variety and quality of the various products, agricultural and mechanical, brought or sent in for the display, and these, taken as a whole, are the foundation of the estimate which the public generally form of it as a prosperous result.

Now, the collecting together of the materials which constitute a fair ought not to give its officers the slightest concern. But the truth is, that there exists a general disinclination or apathy in this respect. Out of the great abundance of farm products, if only a little was contributed by each, enough would be secured to swell our agricultural building to bursting. It requires but little labor when coming to the fair to bring something along as an addition to the collection. If the display proves to be not a creditable one, the farmers themselves are the only ones to blame.

I had a neighbor once, who cultivated a small farm in a small and rather shiftless way. He had a superficial knowledge of many subjects, and could do many things indifferently well; and among his many rather equivocal accomplishments was that of preaching. He sometimes filled the pulpit in the absence of the local minister. But as his pay was poor, his preaching was correspondingly thin. But he was sound in one thing, sound to the core, and that was, the duty he felt resting upon him, no less than upon all men, to be prompt in his attendance upon the county fair, and always to bring something with him to exhibit. One year his crops had been unusually poor, but when fair week came he was filled, as usual, with a determination to do something for the general good—to contribute his mite to the common stock, and as he could not hope to bear off the highest premiums for products of the greatest utility, he adopted just the opposite plan. On the second day of the fair he appeared upon the scene with a flower pot to which he had transferred an enormous pigweed, fully eight feet high, and around which, from top to bottom, he had twined a wreath of flowers. It was assigned a prominent place in the horticultural building, and no one plant created more fun and laughter, or attracted more attention than this big pigweed of the minister. Now, his example is worthy of imitation. Go thou and do likewise. Have something growing during the summer which you intend for exhibition in the

fall, and when the time arrives take it with you, whether it fills your expectations or not. If, upon trial, it comes short in excellence you will have the pleasure of knowing that you have contributed to the satisfaction of your competitors by allowing them to excel you in honorable rivalry, and it will at the same time arouse in you a determination to put forth greater efforts for success the coming year.

All fairs or exhibitions for the display of agricultural or mechanical products are of immense value to the people. I will now endeavor to bring together such facts and arguments as I trust will establish the truth of this proposition. The one word comparison is the key to the whole question.

It is assumed the farmer takes a pride in his vocations; unless he does he cannot be a successful one and is unworthy the name. Farming is a science and must be studied as such if the highest results would be obtained. Vast fields of research are open to him. He must study the improvement of breeds of animals, their disease and the cure, the chemistry of manures, the value of the different soils and subsoils, the effect of rotation of crops, all these and many more could be named with which the successful farmer must be familiar. Assuming again that this knowledge is desirable, from what source it is to be obtained is a natural inquiry. From experiment? Undoubtedly this is a safe guide, but life is too short to repeat all the experiments which have again and again been fully tested by others. It would be a waste of time and money to do it. Assuredly it is the wisest course to take the experience of others in these experiments, to be easily and cheaply obtained through the medium of agricultural publications. From books this much can be learned. It is a mistake to suppose that all book learning is *theoretical* and not *practical*. The standard agricultural works that treat upon chemistry, the kind and amount of food best adapted to animal growth, what breeds of cattle are best for beef and what for milk, etc., etc., present reliable information on these and kindred subjects derived from actual experiment. Hence books are by no means to be discarded but should be diligently and carefully studied. Another source of profit and information may be found in fireside discussions between near neighbors. But this is only an agricultural convention in a small way and both sides are liable to be very soon pumped dry. They are so because each is so like the



other that they have nothing to compare, they are all of one piece. It can't be otherwise when their system of cultivation is by chance alike. When one has reaped no more abundant harvest than the others whether the yield of the potato patch of one is in proportion to all others in the neighborhood. This condition of things will result in killing out all rivalry, there will be no competition, no desire in one to excel the other. As a further illustration, take a section of country where the farm buildings and their surroundings are very much alike and in the average poor and slovenly. No orchards, no beds of flowers, not even a hollyhock, some sunflowers, perhaps, are permitted because it costs nothing to raise them, and besides the seeds are good to fatten chickens for the market when the cattle are poorly fed and sheltered and the chickens even are compelled to scratch for a living. When farm implements and machinery as a rule are left to rot and rust where last used.

Now suppose one of those farmers to be taken with Kansas fever, he sells out, moves away, and a new man takes his place. Perchance this new comer is from a section where fine, large, roomy and nicely painted barns were all the fashion. He has been accustomed to them, feels the want of them, and don't know how to get along without them. Forthwith he sets to work and in due time the old structure is torn down, and the new one is erected in its stead. It has been arranged according to the preconceived plans of the owner. The carpenter has built it and the painter has painted it according to the contract, and the lightning-rod man has been round and adorned its highest peak with one of his patent lightning arresters. Now do you suppose this is to be the only fine barn that will be built in that neighborhood? I tell you, No.

His neighbors comparing their own rude structures with the new, seeing something better, feel a spirit of emulation awakened and they soon catch, not the Kansas but the barn fever, and as good if not better barns are in a short time erected all over the township. In like manner follow all other improvements. But these and all kindred betterments and fixtures, to see and examine them closely, we must go where they are. With the products of the farm the case is different. These can easily be transported to some central and convenient locality, where the fair is to be held, and where all are gathered in and placed side by side, each class by themselves, a comparison of their relative merits can be more easily instituted.

To such places articles for exhibition are often brought from long distances, thus increasing the value of the collection by affording a wider range for comparison.

By these annual exhibitions it has been clearly demonstrated that no section of the state excels the vicinity of Lake Winnebago for the culture of grapes, and one would be irresistibly led to the conclusion, if by chance he had heard the energetic language of our worthy president, Mr. Smith, when looking with amazement at the garden, viz.: table products from the Northern Hospital, that he "would beat those crazy people or know the reason why;" that this vicinity can hold its own in the size and quality of garden products. No one having an orchard bearing only poor fruit could look at the magnificent display of apples by Mr. Chase, of Omro, without wanting to know all about the system of apple raising as adopted by him. He there learns something by comparing his own poor crop with this grand display, and will speedily profit by it. In like manner the house plants of Mr. Miles and Streaver, and the grand show of cut flowers by the various exhibitors, tend directly to create a spirit of rivalry and to encourage a taste for their cultivation by all who beheld their fine exhibit. It is of course impossible to speak of all exhibitors in detail, but the same general rule holds good with them as with these mentioned. Fairs are valuable also as the cheapest and best method of advertising. Merchants and manufacturers bring their wares for exhibition, and by calling the attention of visitors to their respective merits, seek to and often do effect important sales. In the case of farm machinery, by being placed side by side and by applied motive power put in operation their relative merits are more intelligently and economically determined than by any other method. Both purchaser and seller are thereby benefited. The very best farm machinery of all kinds is now considered indispensable. The hired man will be likely to take issue on this subject, but I think experience has demonstrated the fact that the average hired man is apt to be himself a very unreliable machine. He don't take kindly to the idea of erecting an implement from iron and steel and wood that will do the work of many of his class; that is always ready when wanted; that don't stay out late at night, and don't go to town for repairs oftener than once a year, and then is sure to come back sober. That no section can profitably dispense with fairs; that they are worth all they cost in

time, labor and money, seems to be so clearly evident that I shall not pursue the subject further, but close the discussion in the language of the secretary of the society of agriculture of France, that all fairs "aim at nothing but to enable agriculturists of every country to know and teach each other, as well as to prove that the solidarity of usual interests is a guaranty of the union and peace of mankind."

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## PRINCIPLES OF STOCK FEEDING.

BY W. W. DANIELLS, M. S.,

*Professor of Agriculture and Chemistry, University of Wisconsin.*

[Read before the Wisconsin Dairymen's Association, at Appleton, January 18, 1877.]

The thorough treatment of the subject\* under discussion would require, besides the question of the "value of milk, butter and cheese as food," the consideration of the broader question of "the health, feeding and care of dairy cows." In the twenty minutes assigned me in your programme, I shall confine myself more particularly to the feeding of cows, knowing full well that in so short a time, I can call attention to but few of the principles bearing upon this subject, which are alike in accordance with the teaching of science, and with the best practice.

The successful dairyman regards his cow as a machine that is profitable or not, in proportion as she is able to convert much or little crude material, as hay, straw, grass, roots, grain, etc., into milk. Any other machine requires the expenditure of force to overcome its inertia, and the friction of its parts, that is, to put it and keep it in motion, and it is only the force exerted in excess of this amount that is available for useful purposes. So does the cow consume force to carry on the vital processes of her system, and it is only the materials consumed in excess of the amount required for this purpose, that can be converted into useful products. Hence the most profitable cow is the one that, while requiring the smallest quantity of food for her individual use, can, in addition to this amount, convert the greatest proportion of food into milk.

\* The writer was one of three, appointed to read papers at the annual convention, upon "THE DAIRY COW AS A FOOD PRODUCER."

Suppose two cows each to require twenty pounds of food substance to supply the wants of her system, and keep her in a healthy condition, and that in addition to this amount one can digest and convert into milk twenty pounds of food-substance and the other but ten. The former would be twice as profitable as the latter, because, with an equal outlay of capital, she produces twice the results. As a machine, she does twice the useful work.

That I may be clearly understood upon this point, allow me to elaborate a little more fully. The functions of food consumed by a full grown animal are:

1st. The performing of vital work, or that necessary for maintaining the circulation, digestion, respiration, etc., and the maintaining of animal heat.

2d. The performing of useful work, either muscular exertion, as in the case of draft animals and beasts of burden, or in the manufacture of useful products, as milk, meat, wool, etc.

The first class of functions are of much importance to the animals themselves, and hence it is to their maintenance that food is first appropriated. Yet it is the second class of functions only that can yield profitable returns for food, capital and labor expended. It is consequently necessary for the dairyman to keep in mind the conditions requisite for obtaining the greatest value in useful products for the food consumed by his cow. The first condition pertains to the animal herself. Milk is the product sought. Hence, other conditions remaining the same, that animal will be the most useful that converts all the food not needed for her own sustenance into milk. Having animals with this tendency, how can they be kept in vigorous health, in order that every organ may perform its appropriate function, and especially that the digestion may be perfect, not only that the animal may obtain from a given supply of food the greatest possible quantity of milk, but also that the largest amount of food may be digested. For, as before stated, the most profitable cow is the one that digests the most food in proportion to that required for her own physical wants.

One of the essential conditions then, to successful practice, is the maintenance of the condition of the cow's giving milk. In order that this may be done, the digestive portion of their food must be equal in amount, and must contain all the ingredients of the milk produced, in addition to that portion required for her own support.

This is a very commonplace remark. Yet, without doubt, it is one of the weakest points in the practice of American stock raisers. Very few men, I fear, having dairy cows in charge, consider that each 100 pounds of milk requires 4.8 pounds of nitrogenous substance, about the same of sugar, 3.1 pounds of fat, three-tenths of a pound of phosphates, mostly phosphate of lime, and as much more of other mineral matters, and know whether the food furnished is sufficient to supply these amounts, in addition to that required to supply the bodily wants of the animal.

But the power of these same animals to produce milk is as dependent upon the supply of these materials, as is the miller's power of producing flour upon the grain supplied him. Like the miller, the cow creates nothing. The power of both is limited to taking certain materials and changing them from one form into another, in which they are capable of use by man.

Pasture-grass furnishes the different food ingredients in nearly the proportion required, but in this state, artificial food must be at least partially depended upon by dairymen, for eight months of the year. The more nearly this artificial food resembles pasture-grass in composition, the more easily and thoroughly will it be digested, and hence, both so far as the use of the animal power in digestion, and the waste of material are concerned, the more economical it will prove.

During the months when the short pastures are supplemented by soiling, there is no great difficulty in furnishing food having nearly the composition, succulence, and ready digestibility of pasture-grass. Such food is found in the various soiling crops, now so commonly used — clover, rye, oats, lucerne, fodder-corn, etc.

The want of winter food having the succulence, chemical composition and ready digestibility of the grasses, greatly complicates the question of the economical feeding of dairy stock. For no one of these qualities can be neglected without sacrificing, to some extent, the efficiency of food.

For many years, at the Agricultural Experiment Stations of Germany, able chemists have been at work, endeavoring to obtain the data which would explain the intricate relations existing between the chemical composition of food and its economical value.

Many things have been learned, and we are more nearly in possession of that knowledge upon which a rational system of feeding



cattle may be based than formerly. But, as "all is not gold that glitters," so not all has proven to be true in practice that science has first announced as truth. It was at one time supposed that a comparison of the chemical composition of different varieties of food would enable one to tell their relative values, and tables were formed, giving the quantities of one food that must be substituted for a given quantity of another, usually taking one hundred pounds of meadow hay as a standard. This theory of nutritive values was a very plausible one, and is based upon a sure foundation of truth, yet in practice it has failed to prove itself the valuable aid it was at first expected to be.

For this there are several reasons: 1st, two samples of hay may differ from each other but slightly in chemical composition, yet on account of the time of cutting, method of curing and storing, one may be much more valuable than another, because it contains a larger percentage of digestible material, for this must needs be taken into account, in any proper estimation of the value of food. Its nutritive value is so largely dependent upon the condition of the soil, upon which it grew, its method of cultivation, time and method of harvesting, and the way in which it is served up, that no variety of food can be taken as a standard, and no other variety could be found of sufficiently constant nutritive value, for accurate comparison, were a standard to be obtained.

2d. Animals, like human beings, have their idiosyncracies, one being able to relish and digest food that is not as acceptable to another.

3d. Whenever the functions of life, either animal or vegetable, form an element affecting the determination of value in a series of experiments, it is found that science cannot readily draw exact conclusions. It points the direction in which truth lies, however, and it is wise to search for truth by following its guiding hand.

Yet, experiment and practice agree in pointing to the conclusion that there is a close relation existing between the chemical composition of food and its nutritive value, although it may not be possible to express this relation by precise figures. I desire to call your attention to the results of some scientific experiments that may enable you to see how chemical composition of food and its nutritive value are related, and which I trust may be of some use in aiding you toward a solution of the problem of the economical feeding of stock.

Chemistry teaches that cattle food contains, besides a small amount of mineral matter, four classes of substances. First, the class containing nitrogen, called nitrogenous substances or albuminoids. Second, fats; third, starch and sugar; fourth, fiber. Of these, the nitrogenous substances (albuminoids) are considered most valuable, as they are capable of performing certain functions in the animal economy, for which the other classes are not fitted, and they are also present in plants in very small quantities, and hence are difficult to obtain. Of the other ingredients, fat is the most valuable, as it aids the digestion of the other classes, especially of the fiber. Starch, sugar and fiber are usually classed together as carbohydrates, and of them the fiber is least valuable, because least digestible, and all of them perform similar functions in the processes of nutrition.

Not only is it true that food contains these four classes of substances, but it is found to be true that there is a certain proportion in which they may be fed most economically. In experiments that were conducted at Weende, Germany, upon oxen at rest, it was found that they maintained their condition, when fed a daily ration containing, for each thousand pounds of live weight of the oxen, nine-tenths of a pound of albuminoids and seven and one-fifth pounds carbohydrates—in this calculation, one part of fat is reckoned as equal to two and one-half parts carbohydrates—the ratio of albuminoids to carbohydrates being one to 7.9.

Upon another ration containing 1.95 pounds of albuminoids and 7.39 pounds carbohydrates, the proportion being one of the former to 3.8 of the latter, the condition of the cattle was in no way improved. It was found that when the proportion of albuminoids to carbohydrates was increased to a greater proportion than one pound of the former to 7.9 of the latter, there was waste of food, the albuminoids not being all digested.

This experiment was continued upon the same oxen for six months, with six different sets of daily rations, each having a different ratio of albuminoids to carbohydrates. But the first ration above given, having nine-tenths pounds albuminoids and  $7\frac{1}{5}$  pounds carbohydrates for each one thousand pounds live weight, was the cheapest, and the oxen flourished as well upon it as upon rations much more costly, having the albuminoids present in greater proportions. The proportions above given are of the total crude mate-

rial; the proportion of digestible albuminoids to carbohydrates was as one to twelve. Hence, we may conclude that oxen performing no labor require for one part of digestible albuminoids twelve parts of digestible carbohydrates. If animals are performing work, giving milk, or storing up fat, the proportion of albuminoids must be increased. With milch cows, it has been found by a series of experiments similar to those above stated, to be one pound of digestible albuminoids to  $5\frac{1}{2}$  of carbohydrates.

These experiments indicate, if they do not fully prove, that animals digest these different food-substances, the albuminoids and carbohydrates, in proportions that are constant when performing the same kind of work, and that when fed in proportions differing from those obtained by experiment, they are less thoroughly digested, and in so far there is a waste of fodder.

Again, a large number of carefully conducted experiments have shown that, while there is quite a wide range in the requirements of different animals, a milch cow will, on the average, thoroughly digest daily from 24 to 28 pounds of dry food for each thousand pounds live weight of the animals. (By dry food, is meant the residue of food, hay, grain, etc., that would remain after expelling all moisture by subjecting it to a temperature of  $212^{\circ}$  F., that of boiling water).

This 24 to 28 pounds of dry food should contain about one-ninth its weight of digestible albuminoids, one-half of digestible carbohydrates, and one-thirtieth of fats. These numbers may not express, with mathematical exactness, the amount of food required by animals, but being the results of carefully conducted experiments, during which the animals are frequently weighed, the amount of all food accurately taken, the percentage of albuminoids, fats and carbohydrates in the food, and the amount of each digested, determined by chemical analysis, they come with a weight of authority that entitles them to the careful consideration of all who are feeding stock. They furnish the data upon which a rational method of feeding may be based, and it cannot be wisdom on the part of stock owners to continue in the old way, regardless of these sources of instruction.

A machine is valuable in proportion to the cheapness of the energy it exerts, not in proportion to the amount of that energy. So with this milk-producing machine, the cow, the most profitable cow

is the one that produces the cheapest milk, not necessarily the one that produces the most. And the man who is able to so feed his cows that they will produce the greatest quantity of milk from a dollar's worth of food will, other conditions remaining the same, be the most successful in his business.

It being true then that food is most thoroughly digested when the different substances of which it is composed bear the relation to each other above stated, it must as certainly be economy in the feeding of milch cows to ascertain the composition of their food, and regulate that of the daily rations fed, by combining varieties of food having different chemical composition, in such a manner, that the mixture shall contain the different food-ingredients, in the proper proportions. If a coarse fodder, as straw or the marsh grasses so largely produced in this state, which is poor in nitrogenous matter and fats, is to be used, in order that the greatest proportion of it may be digested, some food rich in these ingredients should be fed with it. Or if a food contains more than one part of digestible albuminoids to five and one-half of carbohydrates, it will then be economy to give with it, some cheaper fodder, poor in this valuable food-ingredient, in amount sufficient to reduce the proportion in the whole ration to that in which digestion takes place. In order to fully realize the economy of this method of feeding, it is necessary to keep two things in mind: first, that the nitrogenous portion of food is the most valuable, and hence the necessity of avoiding the waste; and, second, that it will only be completely digested when fed in no greater proportion than that above given.

It is also true that when fed in smaller proportions, the carbohydrates will not be completely digested, yet as the loss of these is slight, compared with that of the same quantity of albuminoids, it is the wiser course to see that there is no excess of these in the rations given. One great difficulty in putting these principles into practice is in finding the composition of food. Certainly no one can afford to pay a chemist for analyzing his cattle food.

Fortunately there is no necessity for this. Both grain and coarse fodder, when grown and cured in the same manner, have very nearly the same chemical composition. These have been analyzed, and the results condensed in tables.

A collection of such tables may be found in Johnson's "How Crops Grow," a most useful book of reference, that should be in

the library of every farmer. By the use of these tables, rations containing the proper proportions of albuminoids and carbohydrates may be quite readily formed, by properly mixing different varieties of fodder. Such a course, accompanied with careful observation of its effect upon cows, modified as experience shall suggest, can not fail to increase the returns from a given quantity of food, even though it has not the precise composition given in the tables used.

Another important question, closely related with the subject under discussion, is, the quantity of food animals should be allowed. Ought a cow to eat all she will if food is kept before her, or is there a limit to her digestive powers, beyond which it is waste to feed her? Experiments designed to test this question have been tried in Germany. Prof. Atwater (and I would commend to all farmers his articles on "Science Applied to Farming," in the *American Agriculturist*) gives the following account of a trial at Moeckem, made by the celebrated Dr. Kuehn, with four cows. "During one period of several weeks, they received all the green clover they would eat. During another, a smaller ration was given, and a part of the clover was replaced by straw. The fodder and milk were carefully weighed and analyzed. Every precaution was taken to insure accuracy.

"The rations in the two periods were as follows:

KIND OF FOOD.	The organic substances contained.	
	Albuminoids.	Carbohydrates
(1) 87 lbs. green clover, and 6.7 lbs. barley straw.....	<i>lbs.</i> 3.8	<i>lbs.</i> 17.8
(2) 123 lbs. green clover.....	5.6	15

"The result was that the cows gave as much milk, and milk as rich in fat (butter) and caseine with the smaller ration, of which a part was straw, as they did with the larger ration of pure clover. The cost of the milk, as based upon the value of the fodder, was just about 50 per cent. more with the clover alone than with the mixture of clover and straw. The 3.8 pounds of albuminoid was



sufficient, and in the pure clover, with its 5.6 pounds, there was a waste. Part of this waste was due to the *ad libitum* foddering, but a part was due to the unnecessarily large amount of albuminoids in the green clover."

This experiment confirms what I have been stating, that there must needs be in cattle food a definite relation between the quantity of digestible albuminoids and carbohydrates, 1 of the former to  $5\frac{1}{2}$  of the latter, in order that the greatest returns may be obtained from the food given, and it also shows that too much food may be given to cows, the limit being the powers of digestion and conversion of the food into useful products.

There is but one other point bearing upon this very broad subject of the economical feeding of stock, to which I can allude in the time allotted me. It is the saving of food by protecting animals from the cold and the storms of our somewhat rigorous climate. In a paper read by me before the Northwestern Dairymen's Association in 1873, on "Feeding, Watering and Sheltering Stock," this question was more fully discussed than it would be proper to do on the present occasion. But it should never be forgotten by dairymen that the maintenance of their cows at a temperature of 98° F. is not a matter of choice with them. Nature will keep the system at this temperature as long as healthful life remains, and if the food furnished is not sufficient to maintain it, the fat and muscle of the animal will be consumed for that purpose. The maintaining of animal heat and the formation of useful products are processes directly opposed to each other.

One is carried on at the expense of the other. Both are supplied from the food digested. But the same food cannot perform both offices, and only the amount not required to maintain the animal temperature can be converted into useful products. It follows, consequently, that the greatest amount of milk can be obtained from a given quantity of food, only when the animal requires the smallest portion for maintaining its temperature. Protection from storms, then, and keeping cows in warm stalls, are equivalent to supplying them with a greater quantity of food, and he who does these most effectually, other conditions remaining the same, will produce the cheapest milk.

Earl Ducie, of Whitfield farm, England, conducted the following experiment, to test the effectiveness of shelter: Two flocks of

sheep, of one hundred each, were fed under like conditions, except that one was furnished a covered shed under which they could run, while the other flock had no shed. The experiment was begun October 10th and continued until March 10th — five months. During this time, the sheep having no shed ate one-fourth more than those having shelter, while at the same time the sheltered flock increased on an average three pounds more per head than the others.

If shelter during the mild winters of England makes a difference equal to one-fourth the quantity of food consumed, it will prove a still greater economy to furnish warm stabling in our much colder climate.

It is true also that food and water given while cold, besides requiring the expenditure of food to warm them, cool the stomach and check digestion, and if they are given in large quantities for a considerable time, tend to produce disease of the digestive organs, and hence seriously affect animals for any useful purpose.

Several series of experiments have been made in France and Germany to ascertain the influence of the quality of food upon the richness of the milk produced. The result of these experiments in every case has been to show that, while the quantity of milk is greatly affected by the kind and amount of food given, the quality of milk is not appreciably affected by the food. For richness in either butter or cheese forming ingredients, the individual cow must be relied upon.

Allow me to recapitulate the points touched upon which affect "The Cow as a Food Producer:"

1st. Quality of food appears not to affect the quality of milk. A "butter cow" or a "cheese cow" must be so from her own inherent qualities, and cannot be created by giving rich food.

2d. Protection from cold and storms saves food, and enables cows to produce more milk than when unprotected.

3d. An average milch cow requires for each 1,000 pounds of live weight, from 24 to 28 pounds of dry food substance per day.

4th. The proportion between digestive albuminoids and carbohydrates, in the food of milch cows, should be  $5\frac{1}{2}$  of the latter to 1 of the former.

# DAIRY STATISTICS

*Of Cheese Factories, Creameries and Private Dairies in the State, as far as could be ascertained, for the year ending December 31, 1876.*

[Taken from the Wisconsin Dairyman's Report by permission.]

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COUNTIES, AND NAME OF FAC- TORY OR PROPRIETOR.	P. O. ADDRESS.	NUMBER OF POUNDS.						No. Cows to each Fac- tory.
		Cheese, Factory Make.	Cheese, Private Dairy.	Cheese, Limberger	Cheese, Swiss.	Butter, Creamery.	Butter, Private Dairy.	
BUFFALO COUNTY.								
William Fisher Cheese Factory	Mondovia .....							
CALUMET COUNTY.								
C. P. Skidmore .....	Stockbridge .....	20,000					600	100
T. W. Scott.....	Brant .....							
Hilbert Cheese Factory.....	Hilbert. ....							
COLUMBIA COUNTY.								
O. B. Prime & Co.....	Fall River.....	116,025						
Lodi Valley Cheese Factory...	Lodi .....	112,430						350
West Point Cheese Factory...	West Point .....	30,880						150
Arlington Cheese Factory .....	Lodi .....	52,050						225
Wyocena Cheese Association ..	Wyocena .....							
A. Chapman Cheese Factory...	Columbus .....							
Poynette Cheese Factory .....	Poynette .....							
J. Whitney Cheese Factory.....	Port Hope .....							

DAIRY STATISTICS.

*Dairy Statistics* — continued.

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*DAIRY STATISTICS.*

COUNTIES, AND NAME OF FAC- TORY OR PROPRIETOR.	P. O. ADDRESS.	NUMBER OF POUNDS.						No. Cows to each Factory.
		Cheese, Factory Make.	Cheese, Private Dairy.	Cheese, Limber- ger.	Cheese, Swiss.	Butter, Creamery.	Butter, Private Dairy.	
DANE COUNTY.								
Hum phrey & Sherwin.....	Mazomanie.....	63,227						
John Arions.....	North Bristol.....	36,000						200
A. Chipman.....	Sun Prairie.....	23,675					3,100	200
Wm. Fischer.....	Paoli.....	25,000						
John Porter.....	Mazomanie.....						6,845	125
Black Earth Cheese Factory...	Black Earth.....	47,123						34
E. P. Sherman.....	Windsor.....							200
Dane Cheese Factory.....	Dane.....	57,528						
Waunakee Cheese Factory...	Waunakee..							200
S. P. Kingsley...	Waunakee.....	3,187					1,188	
Wm. Clark.....	Bellville.....	43,065						34
Dr. Donald.....	Mt. Vernon.....	14,850						
T. K. Potter & Co.....	Cambridge.....	55,420						
								275
DODGE COUNTY.								
Benedict Boss.....	Hustisford.....			45,000				135
Stapleton Cheese Factory.....	Fox Lake.....	18,000						175
R. H. Ellis.....	Beaver Dam.....	40,000						190
Cochrane Cheese Factory...	Beaver Dam.....	100,000						480
Rood Cheese Factory.....	Beaver Dam.....	14,000						140
F. S. Jacobs.....	Atwater.....	70,000						375
W. B. McDonald.....	Lowell.....	11,766						150

J. Crounck .....	Waupun .....	59,090					200
Willis Lang .....	Waupun .....	45,000					175
G. R. Talbot .....	Juneau .....	100,000					475
G. R. Talbot .....	Rolling Prairie .....	38,389					160
Jacob Joss .....	Woodland .....				16,175		50
S. Boss .....	Hustisford .....			4,200			125
M. Greniger .....	do .....			4,200			125
A. Greniger .....	do .....			4,150			120
C. Wellaur .....	do .....			4,500			130
John Hoffman .....	do .....			4,300			125
Chris Kunge .....	do .....			4,200			120
Ealing Spregelburg .....	do .....			4,500			130
Benjamin Boss .....	do .....			5,500			145
M. S. Barrett .....	Burnett .....						
FOND DU LAC COUNTY.*							
Chester Hazen .....	Ladoga .....	137,994					550
Chester Hazen .....	Brandon .....	28,000					150
O. B. Bennett .....	Lamartine .....	90,000					350
D. D. Treleven .....	Byron .....	60,000					220
E. Peebles .....	Taycheedah .....	70,000					212
Wm. Berry .....	Taycheedah .....	40,000					160
Ripon Cheese Factory .....	Ripon .....	12,000					40
J. Crounck, manager .....	Waupun .....	69,090					250
G. H. Downing .....	Waupun .....	25,000					100
Bristol Orvis .....	Oakfield .....	48,000					180
Fayette Bude .....	Oakfield .....				6,000		20
M. Wookey .....	Oakfield .....				2,500		12
— Bradley .....	Waupun .....		9,000				
GREEN COUNTY.							
New Glarus, C. F., C H Wilder .....	Evansville .....	133,000					400
Melvin, Blair & Co. ....	Brooklyn .....	61,721					300
Richmond & Ross .....	Dayton .....						180

\* No. cows in the county, 11,569; No. pounds butter made in the county, 1,541,994; sold, 747,834.





George Legler .....							50
M. Zumbrunnen .....							70
Wittewer & Wittewer.....							80
JACKSON COUNTY.							
O. F. Vincent .....	Taylor .....						
JEFFERSON COUNTY.							
H. Merriman.....	Fort Atkinson.....				4,756		20
Olin, Crossfield & Co. ....	Oakland.....	68,864					215
Olin, Crossfield & Co. ....	Fort Atkinson.....	81,217					260
J. P. Galloway.....	Whitewater .....	76,000					
Thomas Bussey.....	Busseyville .....	9,607					
Z. Wils n .....	Palmyra .....						
Garbutt Bros.....	Palmyra .....						
Concord Cheese Association..	Concord.....	51,000					
G.H.Hoisington Cheese Factory	Farmington .....						
E. P. Ingalls .....	Milford .....	64,000				260	275
H. C. Drake .....	Lake Mills .....	13,435					60
Faville Grove Factory .....	Lake Mills .....	136,000					420
Stephen Faville Factory .....	Lake Mills .....						
Stephen Faville Factory .....	Watertown .....						
D. M. Brown .....	Oak Hill .....	77,177					250
Merrick's Cheese Factory ....	Whitewater.....	85,000				500	280
Cold Spring Cheese Co.—							
Old Cold Spring Factory..	Whitewater. ....	180,768					
New Cold Spring Factory..		150,214					
Hebron Factory .....		156,466					
Palmyra Factory .....		138,496					
C. J. Willard Creamery.....	Lake Mills .....				13,570		100
C. H. & W. Phillips Creamery.	Lake Mills .....				12,500		50
M. C. Jones Creamery.....	Fort Atkinson .....				13,750		50
S. G. Westphall Creamery.....	Fort Atkinson .....						
Benj. Holmes Creamery.....	Fort Atkinson .....						

*Dairy Statistics — continued.*

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DAIRY STATISTICS.

COUNTIES AND NAME OF FACTORY OR PROPRIETOR.	P. O. ADDRESS.	NUMBER OF POUNDS.						No. Cows to each Factory.
		Cheese, Factory Make.	Cheese, Private Dairy.	Cheese, Limberger	Cheese, Swiss.	Butter, Creamery.	Butter, Private Dairy.	
JEFFERSON COUNTY — con.								
E. King, Creamery .....	Whitewater .....							
Jefferson Cheese Factory .....	Jefferson .....							
M. N. Seward .....	Lake Mills .....	69,439						
D. W. Vale .....	Whitewater .....					4,200		19
Solon Brown, Creamery .....	Jefferson .....							
JUNEAU COUNTY.								
John Harpe .....	Union Center .....						1,000	7
M. Lancaster .....	Union Center .....						500	4
D. C. Robinson .....	Mauston .....	18,606						100
D. Robinson .....	Mauston .....						450	
W. Robinson .....	Mauston .....						900	
O. Field .....	Mauston .....						350	
H. Fluna .....	Mauston .....						500	
Wm. Hules Cheese Factory ..	Mauston .....							
Alfred Bower Cheese Factory	Mauston .....							
W. Kimball .....	Union Center .....	15,000					500	67
F. O. Galla .....	Elroy .....	17,600					500	70
C. Miller .....	Elroy .....						800	
J. J. Richew .....	Elroy .....						500	
Andrew Miller .....	Elroy .....						400	
J. N. Grant .....	Elroy .....						600	

## KENOSHA COUNTY.

O. C. Stonebreaker.....	Bristol .....	30,873			1,850	
Edward S. Stanard.....	Woodnorth .....	30,000				100
South Bristol Cheese Factory..	Bristol .....					
W. C. White.....	Kenosha .....	26,500			3,650	50
J. B. Vosburg .....	P. O., Richmond, Ill....	96,000			800	275
J. M. Kellogg Cheese Factory..	Woodnorth .....					

## MANITOWOC COUNTY.

John H. Bonne Cheese Factory	Meeme .....					
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## MILWAUKEE COUNTY.

Wauwatosa Cheese Company..	Wauwatosa....	41,906				
F. H. Zandke.....	North Junction.....			25,040		
A. Thomas & Son.....	Good Hope. ....	14,061			1,750	

## MONROE COUNTY.

Northwestern Creamery.....	Tomah .....	3,403			6,392	100
Jacksonville Factory.....	Tomah .....					
Sparta Cheese Factory .....	Sparta .....					

## OUTAGAMIE COUNTY.

E. M. Gowell .....	Greenville.....				2,000	15
Louis Perrot .....	Greenville..		9,450			27
H. W. Armstrong.....	Freedom .....		1,000			
Edward Nye .....	Fredonia .....		1,000			
H. Brockway.....	Appleton .....		7,040		782	19

## OZAUKEE COUNTY.

J. B. & J. W. Ingersoll Factory	Port Washington .....					
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*Dairy Statistics — continued.*

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DAIRY STATISTICS.

COUNTIES AND NAME OF FAC- SORY OR PROPRIETOR.	P. O. ADERESS.	NUMBER OF POUNDS.						No. Cows to each factory.
		Cheese, Factory Make.	Cheese, Private Dairy.	Cheese, Limberger	Cheese, Swiss.	Butter, Creamery,	Butter, Private Dairy.	
PEPIN COUNTY.								
V. W. Dorwin, Chese Factory.	Durand.....							
POLK COUNTY.								
Made in the county.....			6,250					
Made in the county.....				300				
Made in the county.....						100,000		
RICHLAND COUNTY.								
A. & D. Beckwith.....	Lone Rock .....	82,465						
H. S. Eaton.....	Lone Rock .....	86,109						
A. Shaunce.....	Bear Valley .....	29,802						
G. J. Caswell & Son.....	Lone Rock .....		34,326					
Geo. Turner.....	Sextonville .....	40,000						75
J. A. Schantze Cheese Factory.	Bear Valley .....							
ROCK COUNTY.								
E. Deveau.....	Evansville.....	155,000						450
Parker & Co.....	Shopiere .....	21,507						178
Bent, Cheever & Pierce ..	Clinton.....	93,930						400
B. S. Hoxie.....	Cooksville.....	52,984						175



Reigart & Ross .....	Beloit .....	.....	.....	.....	.....	.....	.....	.....
— Winslow's Cheese Factory	Beloit... ..	.....	.....	.....	.....	.....	.....	.....
Jacob Strang .....	Footville .....	.....	.....	.....	.....	.....	.....	.....
Lima Cheese Factory .....	Lima.....	.....	.....	.....	.....	.....	.....	.....
Milton Cheese Factory .....	Milton .....	.....	.....	.....	.....	.....	.....	.....
C. H. Wilder Cheese Factory..	Evansville.....	.....	.....	.....	.....	.....	.....	.....
Rowley's Cheese Factory.....	Evansville.....	.....	.....	.....	.....	.....	.....	.....
S. J. Goodwin. ....	Beloit .....	.....	.....	.....	.....	5,000	.....	26
O. E. Merrill .....	Beloit .....	.....	.....	.....	.....	.....	2,800	15
L. B. Muse.....	Beloit .....	.....	.....	.....	.....	6,000	.....	40

*Dairy Statistics*—continued.

SHEBOYGAN COUNTY.

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DAIRY STATISTICS.

NAMES OF OWNERS OR LES- SEES.	Post Office.	Location of Factory.	Cows.	Lbs. Milk.	Lbs. Cheese.	Value of Product.
Smith & Gates.....	Sheboygan Falls.....	Lyndon .....	275	878,222	87,376	\$9,016 71
D. Kuentz.....	do .....	Sheboygan Falls.....	227	790,260	79,099	8,198 94
A. D. DeLand .....	do .....	Lima .....	87	326,060	33,424	3,759 95
J. G. Peacock .....	do .....	do .....	125	325,990	32,291	3,260 71
A. G. Dye .....	do .....	do .....	100	329,471	33,381	3,375 71
Mrs. C. Strong.....	do .....	do .....	100	373,980	36,989	3,724 38
Holden Bro's.....	do .....	Sheboygon Falls.....	320	971,106	97,193	.....
Mather Bro's .....	do .....	do .....	275	1,017,021	101,721	10,678 71
Pierce & Sons .....	do .....	do .....	.....	.....	.....	.....
Carl Reich .....	Sheboygan .....	Wilson .....	150	603,221	62,333	6,322 00
G. W. Weeden .....	do .....	do .....	140	457,999	45,919	4,775 00
Fr. Widder.....	do .....	Sheboygan Falls.....	125	356,816	35,690	3,561 00
J. Sieber.....	do .....	Sheboygan .....	50	129,027	12,819	.....
H. Habighurst.....	do .....	Sheboygan Falls.....	150	579,857	58,785	.....
J. A. Smith.....	do .....	do .....	141	387,000	38,105	3,908 00
J. A. Smith.....	do .....	Sheboygan .....	132	334,000	{ 28,000 } { 3,000 }	3,540 00
H. Conover.....	Plymouth .....	Plymouth .....	450	1,516,646	152,807	15,810 83
H. Conover.....	do .....	Sheboygan Falls.....	195	673,666	68,160	7,584 60
S. H. Conover.....	do .....	do .....	250	825,268	81,447	8,551 93
S. Littlefield.....	do .....	Plymouth .....	183	578,259	59,640	5,975 59
Bamford & Wilson .....	do .....	do .....	170	617,628	63,369	6,400 00
Wm. Cook .....	do .....	do .....	85	265,382	28,190	2,818 50
A. Kuentz.....	Howard's Grove .....	Hermon .....	185	596,481	59,620	6,188 59
J. Ochs.....	do .....	Mosel .....	136	300,000	29,000	3,045 00
H. Fisher .....	do .....	Hermon .....	90	229,206	23,155	2,384 00
Wm. Siemers.....	do .....	do .....	80	224,809	23,280	2,405 00

Mansfield & Son .....	Greenbush .....	Greenbush .....	120	380,594	40,847	4,096 60
E. Montgomery. ....	do. ....	do. ....	85	232,659	23,270	2,200 00
F. Joerns. ....	Winooski .....	Lyndon .....	125	464,350	47,473	4,835 66
A. Dye. ....	Union River.....	do. ....	100	346,472	35,628	3,551 26
C. Limplrecht. ....	Mosel .....	Mosel .....	240	670,568	67,273	6,987 00
Conrad Grone .....	Johnsonville .....	Sheboygan Falls.....	190	543,283	53,128	5,312 80
J. Slyfield .....	Hingham .....	Lima .....	160	536,960	52,956	5,394 79
J. Slyfield .....	do. ....	Lyndon .....	156	514,202	51,846	5,379 60
M. Lemmin .....	Edwards .....	Hermon .....	142	445,955	44,005	4,520 50
H. Feldman .....	Elkhart .....	Raine.....	76	190,036	19,578	1,904 00
Geo. Thackery.....	Rathbun .....	Mitchell .....	60	125,679	12,559	.....
S. Reineking .....	Franklin .....	Hermon .....	115	261,100	27,100	2,600 00
C. F. Kellogg.....	Cedar Grove.....	Holland.....	150	274,000	27,600	2,500 00
R. A. Swann .....	Cascade .....	Scott.....	61	127,416	14,157	1,486 48
Wm. Crosby & Co .....	do. ....	.....	170	.....	54,836	.....
John A. Smith.....	Glenbulah.....	.....	100	.....	36,425	.....
O. P. Brown .....	Scott.....	.....	.....	.....	.....	.....
J. Wesselink .....	Gibbsville.....	.....	.....	.....	.....	.....
John Neyler.....	Russell.....	.....	.....	.....	.....	.....
Berkle Guiso Factory.....	Howard's Grove .....	.....	.....	.....	.....	.....
Total .....	.....	.....	6,271	18,805,574	1,983,524	.....

Average amount of milk to pound of cheese,  $9\frac{93.5}{1000}$  pounds. Average price per pound for cheese,  $10\frac{3}{10}$  cents, nearly. Average value of product per cow, \$29.35.

S. LITTLEFIELD,

Sec'y Sheboygan Falls Dairy Board of Trade.

Six new cheese factories are to go into operation in Sheboygan county the coming season, and probably seven; besides two others just across the boundary of the county in Ca'umet and Manitowoc counties: John Kaestner, Sheboygan Falls, 1 vat, 4,000 pounds; C. Groene, Sheboygan Falls, 1 vat, 4,000 pounds; H. Mahler, Sheboygan Falls, 1 vat, 4,000 pounds; H. Habighorst, Sheboygan Falls, 1 vat, 3,500 pounds; Town Wilson Factory, 2 vats, each 3,500 pounds; Lorenz Wirz, Hilbert Station, 1 vat, 4,000 pounds; August Ecke, Meeme, 1 vat, 2,500 pounds. In addition to these, there is to be one, and probably two more, in this county, as follows: J. A. Smith, at Cedar Grove; Bruecker & Reich, at Six Corners, Wilson.

*Dairy Statistics—continued.*

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DAIRY STATISTICS.

COUNTIES AND NAME OF FAC- TORY OR PROPRIETOR.	P. O. ADDRESS.	NUMBER OF POUNDS.						No. Cows to each Fac- tory
		Cheese, Factory Make.	Cheese, Private Dairy.	Cheese, Limberger	Cheese, Swiss.	Butter, Creamery.	Butter, Private Dairy.	
SAUK COUNTY.								
N. W. Morley, Creamery.....	Baraboo.....							
Baraboo Valley Cheese Factory	Baraboo.....							
Cold Spring Cheese Factory...	Baraboo.....							
WALWORTH COUNTY.								
Pearson Bros.....	Sharon.....	285,847						
P. T. Davis.....	Allen's Grove.....	110,000						1,000
Mr. Cole.....	Darien.....	50,000						420
Mr. Phillips.....	Walworth.....	70,000						250
Mr. Phillips.....	Geneva.....	40,000						300
Mr. Vanpatten.....	Delavan.....	40,000						200
A. Logan.....	Elkhorn.....	50,000						150
J. Greenwood's.....	Whitewater.....	102,500						150
Wm. Stowe, Island Fact ry...	Whitewater.....	64,000						
WAUKESHA COUNTY.								
W. Wilton.....	Eagle.....	26,237						
McDonald & Swain.....	Summit.....	76,055						114
T. C. Dousman.....	Waterville.....	70,000						
G. H. Parks.....	Pewaukee.....	20,000						200
Rudolph Kinsley.....	Pewaukee.....			3,300				

F. Shuttis .....	Waukesha .....	171,000					525
Thomas Steel, Jr. ....	Genesee .....	34,665					
Olin & Clinton .....	Waukesha .....	32,456					183
B. R. Hinckley Creamery ..	Oconomowoc .....						
WAUSHARA COUNTY.							
A. H. Wheaton .....	Auroraville .....	21,424					117
WINNEBAGO COUNTY.							
D. Grossman .....	Omro .....	68,500					200
E. Humphrey .....	Oshkosh .....	15,000					100
J. G. Picket .....	Picket's Station .....	39,450					200
L. S. Walter .....	Eureka .....	36,000					200
Charles Vedder .....	Eureka .....	14,807					100
F. Shove .....	Waukau .....	30,000					150
F. W. Wheeler .....	Neenah .....	35,000					150
George Rogers .....	Oshkosh .....	15,907				900	45
James Shindelpolz .....	Oshkosh .....			50,000			
Henry Searles Cheese Factory ..	Picket's Station .....						
Emory Davis, Cheese Factory ..	Picket's Station .....						
C. Bellinger Limberger Factory ..	Oshkosh .....						
John Ryfe .....	Oshkosh .....			18,000			50
Crist. Boss Limberger Factory ..	Oshkosh .....						
Crist Perran Limberger Fac'y ..	Oshkosh .....						
Boss Bros. Swiss Factory .....							
Charles Boso .....	Clemons ville .....		40,000	7,000		1,000	110



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